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An Ethnographic Study of a Kindergarten Teacher's Beliefs and Practices Before and After Mathematics In-Service.

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AN ETHNOGRAPHIC STUDY OF A KINDERGARTEN TEACHER'S BELIEFS AND PRACTICES BEFORE AND AFTER MATHEMATICS IN-SERVICE

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ABSTRACT

This study investigated the beliefs and teaching practices of a kindergarten teacher who participated in the Louisiana Systemic Initiative Program (LaSIP). It focused on the teacher's beliefs and classroom practices both prior to and after the LaSIP summer mathematics in-service activities.

Ethnographic and life history methods were employed. The teacher's self-reports were the primary data source used to determine her beliefs and practices prior to the in-service, with triangulation provided through an interview with her principal and analysis of artifacts. She was observed during the academic year following the in-service activities. Data collection included field notes, audiotapes, photographs, diaries, and artifacts. Quantitative data from a questionnaire and two other classroom observational instruments were also analyzed to determine her beliefs and practices after the in-service activities.

Analyses of the life history data revealed that a variety of academic and personal experiences impacted the beliefs and practices that the teacher brought to the LaSIP in-service. She attended a number of in-service activities before participating in the LaSIP activities. The analyses

indicated that sometimes she rejected or altered suggested workshop proposals.

The results of this study revealed two distinct periods in her teaching that were significant in terms of the beliefs and practices that she brought to the LaSIP in-service. During one period developmentally appropriate mathematics instructional practices were exhibited; while developmentally inappropriate mathematics instructional practices were exhibited during the other. The findings indicated that the change that occurred in her teaching resulted from problems that she experienced in her personal life. The teacher's personal life was intertwined with her school life. She "suppressed" her beliefs about teaching during a period of personal turmoil.

The findings further indicated that the LaSIP activities served as a catalyst for the teacher's reflections about her teaching. Through reflection, she revived developmentally appropriate beliefs and practices that were in evidence before the period of personal problems. This study documented a change in those revived practices in the area of problem-solving.

CHAPTER 1

INTRODUCTION

Recently, there have been numerous calls for reform in mathematics education (National Commission on Excellence in Education, 1983), many of them prompted by the poor achievement scores of students (McKnight, Crosswhite, Dossey, Kifer, Swafford, Travers, & Conney, 1987). Cross-national studies of children's achievement have brought attention to the poor performance of American children. The average scores of American children in mathematics and science have been considerably below those of children from many other countries (Center for the Assessment of Educational Progress, 1989; Stevenson, Lee, & Stigler, 1986).

Additionally, earlier research indicated that there was not a discernible difference between the mathematical achievement of American students and the students from other countries until the junior high level (Husen, 1967). However, Stevenson, Lee, and Stigler (1986) found first grade mathematical achievement scores of children in the United States were below those of Japanese and Taiwanese children in comparable communities. This study also found that the achievement scores of the kindergartners in Japan were higher than those of their counterparts in the U.S.

The practice of comparing the mathematical achievement of young children solely on the basis of standardized tests scores is questionable (Madaus, 1988; Meisels, 1986; National Association for the Education of Young Children (NAEYC), 1988). Due to the rapidity of developmental change and individual variations in the growth and development of young children, student outcome should not be assessed from a quantitative perspective only (NAEYC, 1988). However, American students fared no better whether a standardized paper and pencil or authentic assessment technique was used (McKnight et al., 1987). Consequently, the difference between the matnematical achievement of American students and students from other countries cannot be attributed to the type of assessment used (Price, 1989).

In view of the fact that a difference in the mathematical performance of students was discernible at such an early age, early childhood educators (Bredekamp, 1987; Kamii, Lewis, & Jones, 1991; Price, 1989) joined the reform movement. Many felt that a desired change in student outcome could best be facilitated by an appropriate change in teacher practice (National Council of Teachers of Mathematics (NCTM), 1991).

The teaching practices of many teachers, especially early childhood and elementary, do not reflect what has been learned about how children learn mathematics (Porter, 1989). Research indicates that children construct their own

mathematical knowledge (Kamii, 1985). Moreover, the construction of mathematical knowledge is accomplished through children actively exploring, reasoning, and communicating about mathematics (Labinowicz, 1985). However, in many classrooms, mathematics is still viewed as a passive activity. Consequently, students spend an inordinate amount of time calculating answers to assigned problems. The daily routine in these classrooms consists of teacher demonstrations that are followed by students completing seatwork. The explanations given by teachers during their demonstrations and the questions they ask to determine if the students understand constitute the major portion of communication that goes on during a classroom discussion (Mehan, 1979).

Many school districts and universities have established in-service education in an attempt to provide a more developmentally appropriate approach to the teaching of elementary mathematics (Goffin, 1991; Kurth & Stromberg, 1984; Peterson, 1990; Slaughter, 1981). In-service education is then a purposeful endeavor that focuses on altering "the professional practices, beliefs, and understanding of school persons toward an articulated end" (Griffin, 1983, p.2). Frequently, that stated end is the improvement of student learning.

However, many in-service efforts have found that change is a gradual and in many instances an arduous process for

teachers (Guskey, 1989). In fact, the adoption of new strategies by teachers is usually contingent on their perception of whether or not they can make them work (Lortie, 1975). To change or to try something new is a difficult decision that teachers, like other practitioners, relate to the possibility of failure. "Failure raises the possibility that students would learn less well than with current practices" (Guskey, 1989, p. 446).

In 1991, the East Baton Rouge Parish (EBRP) School System adopted a kindergarten through third grade (K-3) mathematics specialist approach. A mathematics specialist was a K-3 teacher who received extensive in-service instruction in the area of mathematics. The schools where the workshop participants taught were reorganized in order to departmentalize grades K-3. The mathematics specialists were teamed with another teacher at their grade level and taught all of the mathematics for both classes. The EBRP School System in-service program began with 80 teachers. The ultimate goal of this in-service effort was to eventually have K-3 mathematics specialists on the faculty of all 63 elementary schools in the school system.

A faculty member from the Department of Mathematics and a faculty member from the Department of Curriculum and Instruction at Louisiana State University, in collaboration with a professor from Southern University and a mathematics supervisor from the EBRP, developed a model mathematics in-

service summer workshop for the mathematics specialists. This project was funded through a grant from the Louisiana Systemic Initiative Program (LaSIP). Thirty of the 80 EBRP School System teachers expressed an interest in attending the workshop.

Louisiana Systemic Initiative Program

Thirty kindergarten through third-grade teachers attended the 6-week in-service workshop during the summer of 1992. This workshop focused on improving the participants' mathematical understanding and knowledge as they relate to: (a) developing logical thinking skills, and (b) child development and early childhood learning as they apply to mathematics instruction and assessment.

The LaSIP workshop was based broadly on the Standards of the National Council of Teachers of Mathematics (NCTM 1989, 1991). In regard to the Standards, areas of focus for the workshop were: mental math, estimation, geometry, statistics, and probability. The use of manipulatives and technology (calculators and computers) was emphasized. Problem-solving was included within each of these topics. Many of the summer's activities were of a "hands-on" variety. The teachers kept a daily journal of their personal experience. They were told to include personal workshop experience that they perceived to be positive or

negative. They also put together portfolios documenting their summer accomplishments.

Additional in-service training was provided to the teachers during the 1992-93 academic year by the EBRP School System mathematics in-service project. Some of the topics discussed were alternative assessment, estimation, geometry, statistics, probability, and using the calculator to study number patterns. In addition, math supervisors conducted demonstration lessons in each participant's classroom at least once a month.

In order to document the teaching practices of the LaSIP teachers, they were each observed in their classrooms four times during the 1992-93 school year by two researchers, a professor and a graduate student. Both of the researchers were affiliated with the LaSIP project. The first observation focused on the overall developmental appropriateness of their classrooms. The Checklist for Rating Developmentally Appropriate Practice in Early Childhood Classrooms (Charlesworth, Hart, Burts, & Hernandez, 1991; 1993) was revised for this purpose (See Appendix A). Items in this instrument were based on the guidelines of National Association for the Education of Young Children (Bredekamp, 1987). The participants' teaching of mathematics was the focus of the other three observations. Specifically, the degree of implementation of practices relative to the Standards (1989, 1991) was rated.

Another structured observational guide, A Guide for Observing School Mathematics Programs, was used for this purpose (See Appendix B). This instrument was adapted from the guidelines of the National Council of Teachers of Mathematics and the Association for Supervision and Curriculum Development (Blume & Nicely, 1991).

Purpose of Study

The purpose of this study was to investigate the beliefs and teaching practices of a kindergarten teacher who participated in the LaSIP in-service activities. This study focused on this teacher's beliefs and classroom practices both prior to and after the in-service activities.

Research Questions

This study was guided by the following questions:

1. What were the beliefs and teaching practices of the kindergarten mathematics specialist prior to her participation in the in-service activities?
2. Did the beliefs and practices of the kindergarten mathematics specialist change after participating in the in-service activities?

Rationale

The current reform movement (NCTM, 1989, 1991) has advocated changes from the traditional teaching of elementary mathematics to a more developmentally appropriate approach. The call to make changes in content and pedagogy present a paradox for many teachers who are themselves products and producers of traditional instruction (Cohen & Ball, 1990). However, many agree that teachers are central to the success of the reform effort (Huberman, 1993).

Accordingly, studies (Carpenter, Fennema, Peterson, Chiang, & Loef, 1989; Hunsaker & Johnson, 1992; Peterson, 1991; Prawat, 1992) have been conducted on teachers' beliefs and practices and the change process. However, some researchers (Beynon, 1985; Goodson, 1992) have come to believe that changes that teachers make in their beliefs and practices are embedded in wider life concerns and "can only be fully understood by reference to them" (Beynon, 1985, p. 165). According to Goodson (1992), teachers constantly refer to personal and biographical factors in the accounts they give about life in schools.

Consequently, "the conceptual lens and voice of the teacher has moved to the head of inquiry into teaching" (Cole, 1991, p. 184). In fact, it has become less acceptable as well as recognized as less meaningful to study teachers without including their "text" (Cole, 1991).

This study will contribute to the body of knowledge on change efforts by examining a teacher's beliefs and practices and the change process from both a personal and professional perspective. Moreover, since a teacher's voice "carries the tone, the language, the quality, and the feelings that are conveyed by the way a teacher speaks or writes" (Butt, Raymond, McCue, & Yamagishi, 1992, p.57), the participating teacher's voice will be woven throughout this research.

Definition of Terms

For the purpose of this study, the following terms were defined as follows:

Reform — To become a more effective teacher by changing current practices.

Teacher Change — Teachers doing something new that others have suggested they do (Richardson, 1990).

Standards — Guidelines for mathematical instruction that were established by the NCTM in the Curriculum and Evaluation Standards for School Mathematics (1989) and the Professional Standards for Teaching Mathematics (1991).

Ethnography — An in-depth analytical description of an intact cultural scene (Borg & Gall, 1989).

Life History	A person's life story that is located in texts and contexts (Goodson, 1992).
Developmentally Appropriate Practices	Classroom instruction that is congruent with the developmental level and individual needs of students (Bredekamp, 1987).
Informally Learned Knowledge	Knowledge which is acquired through extemporaneous everyday experiences at home or at school.
Bottom-up	Instruction that focuses on the prior knowledge that students bring to a learning situation as the basis for beginning instruction (Hiebert & Carpenter, 1992).
Top-down	An instructional approach that is not primarily based on the prior knowledge that children bring to a learning situation but begins with new information (Hiebert & Carpenter, 1992).

Limitations of This Study

1. Retrospective interview responses were the primary data source used to determine the teacher's beliefs and practices prior to the in-service activities. The teacher and her principal were interviewed. Artifacts (lesson plans,

photographs, a personal statement) and a questionnaire were analyzed also.

2. The researcher's presence in the classroom may have influenced the behavior of the teacher and students (Borg & Gall, 1989).

3. Observers take past experiences into research projects that may result in personal biases (Borg & Gall, 1989). During this study, the researcher was cognizant of her eighteen years of teaching experience in the area of mathematics. Her belief in the effectiveness of developmentally appropriate mathematics instructional practices may be viewed as a personal bias. A diary was kept by the researcher for the purpose of separating emotional viewpoints of the observations from other relevant aspects.

CHAPTER 2

REVIEW OF LITERATURE

Six areas of research are relevant to this study: reform in mathematics education, introducing new practices through in-service education, factors that influence teacher change, studies on beliefs and practices, life history studies, and the role of teachers in student learning.

Reform in Mathematics Education

The recent concerns for reform in mathematics education have come from many sources, for example, The Underachieving Curriculum Assessing School Mathematics from an International Perspective (McKnight, Crosswhite, Dossey, Kifer, Swafford, Travers, & Conney 1987); Everybody Counts: A Report to the Nation on the Future of Mathematics Education (National Research Council of Mathematics, 1989); The Mathematics Curriculum and Evaluation Standards for School Mathematics (NCTM, 1989); and The Professional Standards for Teaching Mathematics (NCTM, 1991). The debate concerning the need for change in school mathematics in America was brought to the forefront with the publication of An Agenda for Action (NCTM, 1980). This report recommended a 10-year plan for revising school mathematics. The Underachieving Curriculum Assessing School Mathematics from

an International Perspective (McKnight et al., 1987) provided additional fuel to the fire concerning this debate. The report emphasized the decline in test scores that made many educators, politicians, and parents question the "back to basics movement" of the 1970's (Corrigan & Mobley, 1990).

The NCTM Standards (1989, 1991) are the catalyst of the present reform movement in mathematics. These documents present NCTM's views on how mathematics should be taught, evaluated, and learned in grades K-12. The Standards (NCTM, 1989, 1991) advocate a change in the teaching of mathematics. Both the roles of the teachers and the roles of students will be effected by this change. The role of the teacher changes from one of dispenser of knowledge to one of facilitator, while the role of the student changes from that of passive receiver of knowledge to that of active participant in the learning process. To accommodate this new way of teaching, teachers are encouraged to reorganize the structure of their classrooms to include cooperative learning and group discussions.

Additionally, the Standards (NCTM, 1989, 1991) advocate a movement away from an emphasis exclusively on speed and correct answers to an emphasis on reasoning, and from an emphasis on memorization and procedures to an emphasis on conceptual understanding. Problem-solving, reasoning, and mathematical thinking should be emphasized. The use of technology (calculators and computers) is promoted.

Mathematical areas such as statistics and probability are to be introduced in the early elementary grades. Hence, mathematical content should be broader as it relates to the incorporation of concepts in teaching as soon as the students see the usefulness of such information that relates to their world.

The NCTM Standards (1989) give five goals that should be reflected in mathematics curricular standards in grades K-12. According to these goals, students should (a) become mathematical problem solvers, (b) learn to communicate mathematically, (c) learn to reason mathematically, (d) value mathematics, and (e) have confidence in their ability to do mathematics. This document also specifies that student activities should evolve from problem-solving situations and that learning is enhanced through active involvement of students with mathematics.

Similarly, the Mathematical Sciences Education Board (MSEB) of the National Research Council emphasized the need to change two assumptions that are popular but outdated: (a) Mathematics is a fixed and unchanging body of facts and procedures, and (b) to do mathematics is to calculate answers to set problems using a specific catalogue of rehearsed techniques. Instead, the MSEB proposes that "mathematics is a creative active process" and that in

mathematics "reasoning is the test of truth" (MSEB, 1990, pp. 10-12).

A report of the National Assessment of Educational Progress called The Mathematics Report Card: Are We Measuring Up (Dossey, Mullis, Lindquist, & Chambers, 1988) suggested that reform in the mathematics curriculum was warranted in the earlier grades as well. According to the report, only 29% of 9-year-olds master the basic mathematics operations that are taught in elementary school.

Mathematical education has undergone many changes since the 1950's. A review of major events will give additional insight into reform efforts (see below). This condensed view of mathematics education is given in 5-year intervals (Halvorson & Stenglein, 1991).

1955-1960 Many Americans began to criticize their educational system after the Russians launched Sputnik in 1957. Large sums of money were provided for curricular revisions.

1960-1965 During this "new math era," textbooks were revised and based on the experimental projects of the 1950's.

1965-1970 This period can be called the "back to basics" period. Many schools began to use the textbooks that were used prior to the 1960's editions. The writings of Piaget

began to impact curricular development in mathematics in other countries.

1970-1975 Piaget's ideas were widely accepted in the United States. Consequently, "hands-on" activities were incorporated in some classrooms.

1975-1980 Due to technological advancement (i.e., calculators), some teachers began to place less emphasis on the need to work by hand such mathematical problems as long division. However, this practice was not widespread.

1980-1985 Problem-solving was proposed as the focus of school mathematics. This recommendation was made in An Agenda for Action (NCTM, 1980).

1985-1990 Such terms as problem-solving, critical thinking, and higher-order thinking processes were and continue to be "buzz words" in school mathematics.

In summary, calls for reform in mathematics came from many different sources in the past. The decisions concerning how and what to teach changed frequently. Today, reformers are advocating less emphasis on practice of isolated computational skill and more emphasis on mathematical thinking, reasoning, and problem-solving. The proposed changes in the teaching of mathematics require that

teachers be introduced to new practices that may occur through in-service.

Introducing New Practice Through In-Service Education

Clearly, the success of all the recent reform reports rests with teachers. The Carnegie Forum's Task Force (Carnegie Forum, 1986) states:

> Textbooks cannot do it. Principals cannot do it. Directives from state authorities cannot do it. Only the people with whom the students come in contact every day can do it. Though many people have vital roles to play, only teachers can finally accomplish the agenda we have laid out (p. 12).

For nearly 40 years there has been a search for an alternative to traditional mathematics instruction. The "new math" of the '60's was not the answer. It is hoped that with more in-depth in-service than in the past, teachers can learn to teach mathematics in a way that is congruent with changes that are currently being recommended (Kloosterman, Gorman, Kroll, LeBlanc, Lester, & Shedd, 1989). By introducing teachers to the latest instructional strategies, in-service education programs are instrumental in countering the isolation that many experienced teachers may feel when faced with change (Anderson, 1987).

Factors that Influence Teacher Change

Many factors may influence teachers' acceptance or rejection of ideas presented in in-service workshops. In fact, there is a reciprocal relationship between teacher change and student achievement. Teachers will not make permanent changes in their teaching practices until they see that the changes are beneficial to their students (Guskey, 1986).

Cobb, Wood, and Yackel (1990) stated that the crucial factor that led teachers to change their teaching practices was the realization by them that their practices were problematic. Poor performance by their students was the primary reason why teachers came to the realization that their teaching practices were problematic. Therefore, like Guskey (1986), Cobb, Wood, and Yackel also found that there is a strong relationship between teacher change and student outcomes. In fact, they stated that the relationship between the two variables was really interactive. When student learning increased, teachers continued to implement new strategies that resulted in a greater improvement in student outcome, and the cycle continued.

Other researchers (Mitchell, Ortiz, & Mitchell, 1987) also found that student outcome is the primary motivator of teacher change. In fact, Stern and Keislar (1977) found that student performance was even a greater incentive for

teachers to change their practices than salary incentives or other external rewards.

After analyzing a number of studies on the implementation of math programs, Tobin (1987) concluded that teachers' beliefs about how children learn and what they ought to learn had the greatest impact on whether they changed their teaching practices. Projects that include teachers from many different schools and grade levels tend to be less likely to produce change. Additionally, teachers with many years on the job were less likely to change their practices (Edwards, 1981).

Loucks-Horsley and Steigelbauer (1991) viewed the individual as the most important player in the change process. These researchers indicated that the change process was highly personal. They stated that the needs of the individual participant must be the focus of help and support designed to facilitate change. They also stated that the change process is developmental. Individuals go through a series of stages in which their perceptions and feelings about implementing the innovation change. Loucks-Horsley and Steigelbauer suggested that greater emphasis should be placed on the needs and concerns of the participants. Gann and Friel (1993) agreed that the change process is both personal and developmental.

Doyle and Ponder (1977) suggested that "practicality ethic" is the basis on which teachers decide to incorporate

proposed changes in their teaching strategies. "Practicality ethic" is the practice of teachers labeling certain change proposals with the term "practical." Those recommendations that are perceived by teachers as being practical are the ones that they will most likely adopt. Those perceived as impractical have little chance of being adopted.

Teachers use three criteria to determine if suggested changes are practical. The criteria are: instrumentality, congruence, and cost. Instrumentality relates to teachers' concern of whether or not proposed changes allow for classroom contingencies. In terms of congruence, teachers want to know if the new strategies will fit their classroom situation. If teachers perceive such strategies as having a possible adverse effect on their students, the strategies will be judged to not be congruent with their present practices and will not be adopted.

The final criteria of practicality is cost. Teachers perceive the cost of implementing new strategies in terms of the ratio between the amount of return and the amount of investment. Factors, other than monetary remuneration, such as teacher recognition and student enthusiasm are included in teachers' analysis of cost.

Shaw, Davis, Sidani-Tabbaa, and McCarty (1990) identified six factors that are necessary for change to occur:

1. Perturbation. This is a dissatisfaction or uneasiness with the way things are. The teacher may not be happy with his or her present teaching methods, or satisfied with students' understanding.
2. Awareness of a need to change. This occurs when the teacher realizes that for things to improve, there will have to be a change.
3. Commitment to change. When a teacher commits to change, he or she has made a firm decision to move beyond awareness and into action.
4. Vision. With the decision to change, the teacher envisions what the change actually will involve.
5. Projection into that vision. This occurs when the teacher visualizes self and class becoming participants in the change.

Shaw, Davis, Sidani-Tabbaa, and McCarthy also indicated that reflection was a necessary factor in the change process. Opportunities for teachers to reflect on their classroom practices throughout the change process were imperative for continued teacher change. As teachers reflected on their teaching practices, they began to question them.

McLaughlin (1991) identified four factors that were central for the implementation of suggested changes. The four factors were: institutional motivation, project

implementation, institutional leadership, and certain teacher characteristics. Institutional motivation is related to the reasons teachers gave for participating in projects. Some teachers were motivated to participate because of a desire to improve student outcomes, while others simply wanted to participate because the school system sponsored the project.

Well-conducted staff training and support increased the possibility of the project being implemented. Teachers responded more favorably to projects that they perceived to have effective directors. The most powerful teacher characteristic was the belief that he/she could even help the most difficult or unmotivated students.

Richardson (1990, 1991, 1994) reported that teachers make self-initiated changes in their practices all of the time. Examples of self-initiated changes include trying new activities and adopting new teaching strategies such as the whole language approach. Interestingly, Richardson found that self-initiated changes were assessed by teachers in a similar manner as those suggested by others. If they did not work, the teachers discontinued their use or altered them radically. The teachers used four criteria to determine whether or not the new strategies were working. The criteria were: (1) how well they matched their beliefs about teaching and learning, (2) the degree to which they engaged the students, (3) to what extent they allowed the

teachers the degree of classroom control they felt was necessary, and (4) to what degree they helped the teachers respond to system-level requirements such as test scores.

In summary, student outcome carries great weight in the teacher change process. Sometimes teachers analyze proposed changes in terms of whether or not they are practical for their teaching situation. Other factors that influence change include teachers' awareness of a need to modify their practices, their commitment to, and their vision of the process.

Change is often personal and developmental. Opportunities for reflection are vital to the change process. Proposed changes that do not fit the beliefs of teachers are often rejected or altered. The following section of the literature review contains additional details on teacher change that resulted from various studies on teacher beliefs and practices.

Studies on Beliefs and Practices

Forty first-grade teachers participated in the Carpenter, Fennema, Peterson, Chiang, and Loef (1989) study. Half of the teachers served as the control group. The other 20 teachers participated in a 4-week summer in-service program that was based on the Cognitive Guided Instruction (CGI) approach, which is grounded in the belief that the

teaching/learning process is too complex to be scripted in advance, and as a consequence teaching essentially is problem-solving. Therefore, researchers and educators can help bring about changes in classrooms by helping teachers make informed decisions rather than training them to perform in a specified way.

Carpenter et al. (1989) investigated whether giving teachers access to knowledge that is derived from research on children's thinking about addition and subtraction would influence the teachers' instruction and their students' achievement. The teachers and the students were observed throughout the academic year that followed this in-service effort. Near the end of the study the teachers were asked to predict how their students would solve specific problems. The teachers' responses were compared to the students' responses. A questionnaire was given to the teachers to determine their beliefs about the learning and teaching of addition and subtraction. The students were given a pre- and a posttest that focused on their problem-solving abilities. They were also interviewed as they solved a variety of problems.

The researchers observed important changes in the instructional decisions of the experimental teachers. They concluded that the experimental teachers taught problem-solving significantly more and number facts significantly less than the control teachers. The experimental teachers

also encouraged students to use a variety of problem-solving strategies, and listened to processes their students used significantly more than did control teachers. The experimental students exceeded control students in number facts knowledge, problem-solving, reported understanding, and reported confidence in problem-solving.

Similar to the teachers in Carpenter et al. (1989), the fourth grade teacher in the Steinberg, Carpenter, and Fennema (1994) study attended in-service activities that were based on the Cognitive Guided Instruction (CGI). The study was conducted during the teacher's third year of teaching. She implemented CGI strategies the first year and was still using the approach.

The first author of the study (Steinberg) was a participant observer in the teacher's classroom during a 5-month period. The researcher observed 30 math lessons during that time. Data were collected through audiotapes and fieldnotes. Nine students were randomly selected as target students. They were observed while solving problems and later interviewed to ascertain their perceptions of how they solved the problems. These students kept journals of their math work which were examined by the researcher. The other students in the classroom were observed on a rotating basis.

Additionally, the researcher met with the teacher for approximately 30 minutes once a week. Thirteen such

meetings were held. These interviews focused on the teacher's knowledge of her students' thinking, her decision making processes as they related to the children's thinking, and the changes she was experiencing in her thinking and practices. The researcher also discussed her interviews with the students and specific solution strategies that she observed the children using.

Steinberg, Carpenter and Fennema reported that the teacher went through four phases of change during the five month study. The first phase focused on the teacher's classroom practices and thinking at the beginning of the study. In this phase, the teacher provided many opportunities for the children to solve problems and to share their strategies. However, she perceived her role as passive regarding promoting student progress. She seldom encouraged the children to think of alternative ways to solve problems.

Phase 2 was a very intense period for the teacher. She began to reflect on her practices. She became aware of her lack of knowledge about the children's thinking. With her awareness of a lack of knowledge about the children's thinking came the desire to learn more in this area.

In the third phase of change, the teacher began to spend more time working with individual students. Consequently, she began to understand more about their thinking as it related to the strategies they used to solve

problems. The teacher's reflection-in-action fostered reflection-on-action.

In phase 4, the teacher examined all of her teaching practices. She began to use the knowledge she gained from her interactions with individual students as a guide during whole group discussions.

The researchers concluded by emphasizing that although the teacher made significant changes in her teaching, the change process was very difficult for her. Emotionally, it was difficult to experience conflicts and dilemmas while solutions for these problematic situations were not obvious. Finally, the researchers stated, "it is important for teachers to get support when they try to reform their classrooms" (p.36).

Wilson and Ball (1991) investigated the learning of two elementary teachers who participated in the SummerMath for Teachers Program. The in-service program focused on developing a constructivist orientation to teaching and learning for participants. The program began with a 2-week summer workshop that was followed with a year of intensive follow-up of teachers in their classrooms by the SummerMath staff members. The classroom visits included observations and lesson demonstrations.

Through observations and interviews, the researchers documented changes in the teachers' visions and practices over a 2-year period. While these two teachers responded

differently to the in-service experience, both changed their teaching practices in ways that were congruent with a constructivist orientation.

Greabell and Phillips (1990) reported on the Summer Mathematics Institute, which was an in-service workshop for elementary teachers. The goal of this workshop was to improve teachers' ability to provide meaningful, effective mathematics instruction to children. Eighteen teachers participated in the in-service training. The program was delivered in twelve 5-hour sessions.

Greabell and Phillips determined the effectiveness of the in-service training by administering a pre- and a posttest to the teachers. The items on the pretest were congruent with the eight general objectives for the workshop that covered six mathematical topics. The pretest was administered to the teachers 3 weeks prior to the workshop. A posttest was administered on the last day of the workshop. Based on the fact that the teachers showed a statistically significant increase in their mathematical knowledge and application levels, the in-service training was judged to be successful.

The teachers were interviewed 6 months later to determine the extent to which they were integrating the content of the workshop activities in their classrooms. The researchers concluded from the participants' responses that

they were using the materials and activities modeled at the workshop in their mathematics instruction.

Kloosterman, Gorman, Kroll, LeBlanc, Lester, and Shedd (1989) described a project that provided in-service training to 89 elementary teachers and six principals. Topics for the workshop included cooperative learning, problem-solving, and the use of manipulatives. The primary delivery system for this project was six 4-hour workshops, conducted by nationally known experts in elementary mathematics education, over a 9-month period. There was extensive interaction and follow-up with a selected sample of 24 of these teachers. The selection of the 24 teachers who served as the sample was based on the criterion that they worked in the same school.

Kloosterman et al. (1989) concluded that the teachers integrated the techniques they learned in the in-service program in their classroom teaching. This conclusion was based on the teachers' self reports which were verified by their principals.

Using a collaborative approach, Hunsaker and Johnston (1992) reported on the changes that occurred in a third-grade teacher's beliefs and practices over a 4-year period. Johnston, the researcher, gathered data for 2 years while Hunsaker, the teacher, was enrolled in a master's program.

Data sources included pre- and postprogram interviews, videotapes of the teacher's classroom practices, classroom

observations, and course work materials. All videotaped and observational sessions in the classroom were followed with interviews. A collaborative dialogue continued between the researcher and teacher two years after the teacher received her master's.

It was found that as the teacher tried new teaching strategies, she judged the merit of new practices by the effects they had on her students. As a result, her beliefs changed. These changes were credited to the reflective thinking and collaboration which were promoted by the master's program and the research project. This study further suggested that substantive change is a long-term process.

A third-grade teacher, whose personal goal for the 1989-90 school year was to work on learning more and on changing and improving her mathematics teaching, agreed to be the focus of a research study. Peterson (1991) analyzed changes in her beliefs and practices as she worked toward her goal.

The researcher spent one day a week in the teacher's classroom during the school year. Data were gathered through observations and audiotapes. Additionally, interviews were conducted after each observation. These interviews focused on what the teacher was trying to teach, why she was teaching it, and what she hoped the students would get from the lesson.

The teacher engaged in several learning activities during this case study year. These activities included participating in a weekly meeting with fellow faculty members and serving as a member on a district-level mathematics committee. She also had the opportunity to observe two of her peers teach.

Peterson reported that the major change in the teacher's beliefs was related to her revising her thinking on how students learn mathematics. This change in beliefs was reflected in a definite move away from "teaching as telling" to the use of a problem-solving approach.

Prawat (1992) examined the relationship between a fifth-grade teacher's beliefs and practices and her responses to a call for change in teaching by California's Mathematics Framework. This document emphasized the need for more problem-solving, estimation, the use of manipulatives, and the use of mathematics in real-world settings. The teacher's school district adopted a new mathematics curriculum that was more conceptually oriented in light of the reforms called for by the Mathematics Framework.

Data were gathered through observations and interviews. Prawat found that the teacher's beliefs about mathematics teaching changed. He related this change to the teacher's attempt to come to terms with the new mathematics curriculum. Less change occurred in the teacher's beliefs

about mathematics learning; while, there was no evidence that she changed her beliefs about the nature of mathematics as a discipline. Consequently, the change that occurred in her beliefs did not translate to a change in classroom practice.

Wood, Cobb, and Yackel (1990) investigated how a second-grade teacher reorganized her beliefs and practices as she implemented a cognitively based mathematics curriculum in her classroom, and whether these changes influenced her teaching of reading. Data sources were video recordings, ethnographic field notes, and audio recorded interviews.

The researchers observed the teacher during the year prior to the project and described her as a traditional teacher who always followed the textbook. Additionally, the researchers asked the teacher to interview her students to ascertain their understanding of mathematical concepts. While interviewing two of her better students at the end of the year, the teacher discovered that their understanding of several basic mathematics concepts had not increased even though they could give her correct answers. At this point, the teacher realized that her textbook-based practice was problematic.

The following year cognitively based strategies were implemented in this classroom. Instructional materials that were developed by the researchers and the teacher were used

instead of the textbook. According to Wood, Cobb, and Yackel, the teacher changed her beliefs and practices dramatically and implemented problematic instructional activities that encouraged the active involvement of students. Ironically, there was no indication that these changes influenced her teaching of reading.

In another study on beliefs and practices, Wood, Cobb, and Yackel (1991) again examined a teacher's learning within the setting of the classroom. Data were gathered over a period of one year. Data collection consisted of video recordings, ethnographic field notes, open-ended interviews, and samples of students' work.

These researchers concluded that the changes that occurred in the teacher's practices were related to a reorganization of her beliefs about the nature of mathematics, the learning of mathematics, and the teaching of mathematics. Regarding the nature of mathematics, the teacher's practices changed from placing a tremendous amount of emphasis on rules and procedures to providing meaningful activities and using a problem-solving approach. As the school year progressed, the teacher's practices reflected a shift in her beliefs from children as passive learners to children actively involved in the learning process. The researchers indicated that the change in the teacher's beliefs about the nature of teaching was evident when she began to initiate and guide students' development of

knowledge rather than continue the practice of trying to transmit knowledge.

Taylor (1990) reported on the impact that a teacher's beliefs have on the change process as the teacher attempted to develop a constructivist classroom learning environment. Like Hunsaker and Johnston (1992), Taylor used a collaborative approach. During the first year of the study, data were gathered through observation, field notes, and interviews. The researcher engaged in frequent dialogue with the teacher while providing readings on constructivist theories of knowledge. Additionally, the researcher assisted the teacher in planning and evaluating teaching strategies.

Taylor described the teacher's established practices as consisting of whole-class teacher presentations with tremendous emphasis on covering the syllabus, while little interaction occurred with students. It was found that during a process of conceptual change the teacher did develop a belief that students construct their own mathematical knowledge and, therefore, should experience a self-paced learning environment in which the teacher adopts an interactive role. However, a conflict developed between the teacher's belief about how students construct their knowledge and his belief that all students should cover identical syllabus content. Taylor concluded that this

conflict restricted the nature and scope of the teacher's conceptual and practical classroom changes.

In sum, the change process can be difficult for teachers. A change in beliefs often occurs only after teachers have noticed a change in the performance of their students. A change in teaching practices in one curricular area does not guarantee similar changes will occur in other curricular areas.

Considering the complexities in the study of teacher change, it appears that knowledge of teachers' personal lives might offer additional insight into their beliefs and practices and the change process (Beynon, 1985; Goodson, 1992). The following section in this review will include studies that have been done on teacher change in which life history data were gathered.

Life History Studies

Life histories may be biographical or autobiographical in nature. This review revealed that biographical studies are more prevalent in the research that has been done on teacher change. Newman (1979) interviewed ten teachers who had 20 to 30 years of teaching experience to determine what stages their careers had passed through and how their attitudes had changed over the years. Data were collected during two in-depth interviews with each teacher. A

biography was then written for each of the teachers in order to show a holistic portrait of each participant. The teachers were then analyzed as a group according to common themes identified in the interview data. Newman found that the teachers' careers were characterized by early job mobility, high satisfaction in the first ten years, and a feeling of crisis as retirement approached. Most of the teachers altered their teaching methods and became more flexible in dealing with students over the years.

Burden (1979) interviewed elementary teachers to obtain their perceptions of how they had changed, both personally and professionally, during their careers. Their teaching careers varied in length from 4 to 28 years. Burden identified three stages of a teacher's career. The first year of teaching, which was identified as the first stage, was characterized by an emphasis on subject-centerness, a lack of confidence, an unwillingness to try new methods, and a preconceived notion of "teacher."

The second stage included the second through fourth years. The teachers noted that during this period they learned a great deal about children, curriculum, and instruction. They also gained confidence in themselves.

During the final stage, which included the fifth and subsequent years of teaching, the teachers were child-centered, tried new strategies, and abandoned their original image of "teacher."

Raymond and Surprenant (1988) used ethnographic and biographical methods to examine how one aspect of a teacher's present knowledge of her practice, the idea of responsibility, changed throughout her career. In the initial state of the study, the researchers used an ethnographic approach while analyzing what the "the idea of responsibility" means in terms of the teacher's current teaching practices. The data were gathered during a 3-month observational period.

Biographical data were then collected during a 2 1/2-month period. The researchers used semistructured interviews for this purpose. The interviews focused on the teacher's "idea of responsibility" during her life prior to entry into teaching as well as her professional development. It was found that the teacher's "idea of responsibility" changed over the years from the belief that she was solely responsible for student learning to the idea that the students shared this responsibility equally with her.

In sum, a limited number of life history investigations have been made in the area of teacher change. Additionally, most of the research that has been conducted on teacher change, from a professional and a personal perspective, has focused on change over the course of a career.

Although a kindergarten teacher's beliefs and practices and the change process are the focus of this research, change will be determined by her interaction with students

within the classroom setting. Thus, it is imperative that this review contains a brief review of some of the literature on the teacher's role in young children's learning of mathematics. It is in that direction that this review now turns.

The Role of Teachers in Student Learning

The mathematics experiences that children have at the early childhood level (ages 5 through 8) form the foundation for their future work in mathematics (Bredekamp, 1987). In order to provide developmentally sound experience, early childhood educators need to understand how children learn (Barnett & Young, 1982; Barron, 1979; Bredekamp, 1987; Copeland, 1984; Kamii, 1982; NCTM, 1989).

Palmer (1991) synthesized the research of both the National Association for the Education of Young Children (NAEYC) and the NCTM that relates to how children learn.

1. Young children learn through concrete experience. Abstraction accounts for little to no knowledge construction.
2. What children figure out for themselves, with appropriate scaffolding, they are likely to understand and remember. What they are merely told, they are more likely to forget.

Children in this age range learn more by touching, seeing, smelling, and tasting than just by listening (Bredekamp, 1987). Moving and exploring enhance these processes. As young children construct, modify, and integrate ideas by interacting with their physical world, materials, and other children, they assimilate mathematical knowledge (NCTM, 1989).

The ideas above have far-reaching implications for teachers in regard to the role they have in ensuring successful student learning. In summary, the research suggests that teachers of young children (a) provide an environment in which students are actively engaged, (b) use a problem-solving approach, (c) build on students' prior informal mathematical knowledge, (d) provide meaningful experiences that relate to children's lives outside of school, (e) facilitate language development, and (f) provide opportunities for learning through play (Bredekamp, 1987; NCTM, 1989). In the following sections, I will elaborate on these suggested practices that were culled from early childhood research.

Providing an Environment in Which the Students are Actively Engaged

Instruction that encourages the active involvement of children provides the best means of helping children

construct mathematical understanding (NCTM, 1989). There are numerous ways to actively involve students. Games and concrete materials have been viewed as very successful toward this end (Baroody, 1987).

Kamii (1985) stated that games give a child his/her own reason for doing mathematics. Children provide feedback and check each other's thinking, which enhances their mathematical understanding. Active discussion also encourages children to have opinions of their own and to defend them.

Older children (ages 10 and above) are typically physically ready to sit for sustained periods. However, younger children actually get more tired when they are sitting still and listening to a teacher talk than while moving around the classroom. Additionally, the frontal lobe, the part of the brain that applies the brakes to children's natural curiosity, is still immature in 5- through 8-year-olds. Thus, as the lobe develops so does the "boredom tolerance" of children. In other words, learning is less boring for children when they are actively involved (Kantrowitz & Wingert, 1989). Therefore, teachers need to make use of group work or group projects as children are more active in such settings (Barnett & Young, 1982; Cobb, 1985; Copeland, 1984).

Using a Problem-Solving Approach

It is suggested that teachers use a problem-solving approach that emphasizes hands-on experience as the focus of early childhood mathematics (Barnett & Young, 1982; Cobb, 1988; NCTM, 1989). Teachers can motivate students to become problem solvers by encouraging their physical, intellectual, and verbal involvement in mathematics. Children's physical involvement is often aroused by concrete materials. Such materials frequently lead to questions, new ideas, and better ways of looking at the world (Barnett & Young, 1982).

Questions by the teacher and other students will spark intellectual and verbal involvement. Children often find flaws in their thinking while responding to such questions (Barnett & Young, 1982). According to Barnett and Young (1982), questions that encourage students to think, reason, and generate alternatives are:

1. What do you think will happen next?
2. Can you think of another way to solve this problem?
3. How are these shapes alike? different?
4. Do you see a pattern in these numbers?

Instead of providing direct instruction on problem-solving, Jacobson, Lester, and Stengel (1980) suggested that teachers of young children provide activities that the

children can reflect on and then answer using problem-solving strategies. Jacobson et al. (1980) stated:

> Teachers should provide experiences that encourage students to try different approaches, talk with their classmates while working on problems, and discuss the relative merits of different approaches. Such an atmosphere will not only motivate students but also lead to more mature problem-solving procedures (p. 134).

Building on Students' Prior Informal Mathematical Knowledge

Many researchers state that children come to school with an immense amount of knowledge about counting, numbers, and arithmetic (Baroody, 1987; Carlson, 1992; Charlesworth, 1986; NCTM, 1989; Suydam, 1987; Wortham, 1984). This informally learned knowledge serves as the foundation for the mastery of school-taught mathematics (Baroody, 1987; Suydam, 1987).

Hiebert and Carpenter (1992) described a teaching approach that is based only on the informally learned knowledge of children as a bottom-up instructional approach. In contrast, a top-down instructional approach does not primarily focus on the prior knowledge that children bring to a learning situation. According to these researchers, an ideal classroom environment reflects a balance between bottom-up and top-down instructional approaches. Such an approach may lead to instruction that is more meaningful and interesting. It is also theorized that a combination of

these two approaches is useful in terms of judging the need to correct erroneous understanding in informal knowledge.

Providing Meaningful Experiences that Relate to Children's Living Outside of School

Like adults, children fail to retain unconnected bits of information. Learning that is based on meaningful relationships is more likely to produce "transfer" than memorization (Baroody, 1987; NCTM, 1989). To promote meaningful learning, it is necessary to help children see the relationship between instruction and their existing knowledge and past experiences. Meaningful learning is unlikely to occur unless a child has the ability to assimilate new instruction. This can only be more readily accomplished if the child can make a connection between what is being taught and what has been previously learned (Baroody, 1987).

Many children are doing poorly in school simply because they fail to see the connection between living and learning. However, these children have had a variety of experiences outside of school that have not been tapped as "springboards for learning" (Mills, 1993, p. 19).

According to Mills, there are no disadvantaged children because all children come to school with experiences that can be related to mathematics. For example, all children

lose teeth. Mills suggested that teachers could use losing teeth as an "authentic mathematical experience" and have children compose "teeth stories" in which math strategies such as addition and subtraction are used. Mills also suggested that "when children construct mathematical stories that are derived from their experiences, they infuse the stories with a richness of detail not found in basal mathematics textbooks" (p. 19).

Facilitating Language Development

Oral language development is among the many developmental tasks that are critical for children in the age range 5 to 8 years. It is proposed that teachers can facilitate this development by talking with the child (not at the child) about shared experiences and activities (NCTM, 1989). Oral language development can further be enhanced through interaction with classmates. Thus, as students explore mathematical ideas, they should be encouraged to discuss their thoughts and findings with their peers as well as with their teachers (Thomas, 1991).

A classroom environment that includes interesting centers and the engagement of students in problem-solving activities provides an enriched setting for the development of oral language. In fact, children actually generate more ideas in such a setting (Shores & Lombardi, 1992).

Providing Opportunities for Learning Through Play

"Play is the child's medium for learning," states Sponseller (1974, p.6). Play helps to define the integration of knowledge because naturally it blends language, thought, and imagination (Seefeldt, 1990). Mathematically speaking, children are able to learn many concepts through instructionally enhanced play. For example, the knowledge of measurement may be augmented by playing in a sandbox. A child may conclude through experimentation that one bucket of sand will fill a box, a fact that may disprove the child's previously held notions. The child may then try to resolve this perceptual conflict through some kind of logical thought process (Copeland, 1984).

In summary, children are active learners. Therefore, teachers need to provide a classroom environment that contains a variety of "hands-on" activities. Such an environment should include blocks, counters, geometric models, water, sand, and puzzles. It is equally important that opportunities for social interaction be provided. Additionally, teachers of young children should look to the children for cues in terms of pacing activities.

Summary

Reformers in mathematics are advocating less emphasis on memorization and procedures and more emphasis on conceptual understanding. These suggestions often are in conflict with what many teachers believe about the teaching and learning of mathematics (Cohen & Ball, 1990). In order for teachers to change from the traditional role of "directing" and "telling" to one of "facilitating," carefully planned and structured in-service programs must be offered. Even with such programs, the ultimate decision concerning the rejection or acceptance of ideas put forth rests with each individual teacher.

Teachers who change from a more traditional approach provide a more developmentally appropriate approach to teaching mathematics by allowing students to take an active role in the construction of their own knowledge. Guided discovery, discussions, problem-solving, and the use of concrete materials play a significant role in the learning and teaching process in such classes.

CHAPTER 3

METHODOLOGY

The purpose of this study was to investigate the beliefs and teaching practices of a kindergarten teacher who participated in the LaSIP summer in-service activities. This study focused on the teacher's classroom practices and beliefs both prior to and after the in-service activities. The questions guiding the study were the following:

1. What were the beliefs and teaching practices of the kindergarten mathematics specialist prior to participating in the in-service activities?
2. Did the beliefs and practices of the kindergarten mathematics specialist change after participating in the in-service activities?

This chapter begins with a rationale for the selected methodology. Explanations for the selection of the participating teacher are discussed. Then, descriptions of the participating teacher, her school, and the children in her classroom are given. The process of gaining entry and my role in the social scene are delineated. Finally, the data collection and analysis procedures and the triangulation strategies employed in this study are discussed.

Rationale for the Methodology

Many researchers have used ethnographically-informed life histories for years in psychology and other applied behavioral sciences when attempting to gather in-depth details about a person's life (Langness & Frank, 1981). In fact, Woods (1985) suggested that life history data can deepen ethnographers' understanding of what they observe.

During the last 20 years, life history methodologies have been used by researchers for inquiry into the nature of teaching (Butt & Raymond, 1989). As a result, research has become more personal and contextual (Cole, 1991).

In recent years, some researchers have come to believe that changes that are made by teachers in their beliefs and practices are embedded in professional and personal circumstances and can best be understood by reference to them (Beyon, 1985; Goodson, 1992). Thus, the life history approach is viewed as appropriate for studying teacher change because it provides the researcher additional meaning to the immediate by contextualizing it in the totality of a life or lives (Beynon, 1985).

Accordingly, an ethnographic methodology was used in this study, because it could provide descriptive data about the beliefs and practices of a kindergarten mathematics specialist. Such a research method also allows one to get a holistic view of the teacher's instructional practices

within the context of the classroom setting (Lincoln & Guba, 1985). A life history approach was used in conjunction with the ethnography (Woods, 1985) in an attempt to view possible changes in the teacher's beliefs and practices from both a personal and professional perspective (Beynon, 1985; Goodson, 1992).

Spradley's (1980) Developmental Research Sequence (DRS) was used as the primary guide for this study. The DRS is an inductive model designed to reveal the components of a social phenomenon, the relationships among components, and their relationship to the wider social contexts involved. This model was selected because of its logical descriptive progression from unfocused stream of chronicle reporting to more focused analysis of specific relationships within the social scene.

The Participant

A kindergarten teacher who was a mathematics specialist was selected for this study. I chose one participant because such a strategy provided a greater opportunity for an in-depth analysis of her beliefs and practices (Borg & Gall, 1989) from a multi-dimensional perspective (Beynon, 1985).

Selecting the Participant

I was a graduate assistant for the LaSIP summer in-service activities. Before meeting the K-3 teachers who were participating in the LaSIP workshop, I had an abstract ideal of a participant for my study in mind. First, I hoped to convince a kindergarten teacher to become a part of this project. A review of the literature indicates that most of the studies that have been conducted in the area of mathematics focused on teachers in the first grade and above.

Second, I hoped to find someone who had a pleasant personality. Finally, I wanted to find someone who was willing to give of his/her time. Although the observational data would be gathered over a 3-month period, I needed someone who would have the time to participate in the extended interviews during the summer.

Due to other responsibilities, I did not attend the workshop on the first day. Upon arriving the next day, I joined a group of teachers at a table. Although all of the teachers were very nice and moved their chairs to make room for me, one teacher was particularly friendly. She offered me her notes from the day before. She also moved over to share her hand-out with me. Each of the six teachers introduced themselves to me. They told me which grade they taught and where they worked. Two of them, including the

teacher who was very pleasant (Melissa) (pseudonym), taught kindergarten.

Five of the other LaSIP participants were kindergarten teachers. After observing each of them in the workshop and through informal conversation asking questions to find out about their teaching experience, I decided to approach Melissa about the project. I told her about my study in the hall one day during a break and asked her if she would be willing to participate in it. She replied, "I would love to. Maybe I'll grow from the experience."

A Description of the Participant

Melissa is a 45-year-old European-American with 17 years of teaching experience. She has been teaching at Clinton Elementary (pseudonym) for 8 years. Each of those 8 years have been spent teaching at the kindergarten level. Prior to working at Clinton Elementary, Melissa taught preschool for 3 years, middle school mathematics for 2 years, and kindergarten for 4 years.

A Description of the School

Clinton Elementary was located in a low-income neighborhood of a Southern city that has a population of

approximately 450,000. The neighborhood population was predominantly African-American.

The school served students in kindergarten through fifth grade from the local community. Additional programs were provided at the school to attract European-American students. These included a magnet program and classes for identified gifted and talented students.

A basic education curriculum was used in kindergarten, first, and second grades. Ninety-six percent of the students enrolled in these grades were African-American children from the immediate or surrounding neighborhood. Four percent of the students were European-American. Ninety percent of the kindergarten through second-grade students received free lunch.

Grades 3, 4, and 5 served students who were in the magnet or gifted and talented programs as well as those students who participated in the basic education curriculum programs. Regarding these various programs, there was some integration of students in the area of social studies. Forty percent of these children were European-American and 56% were African-American. Four percent of the children were members of various other minority groups. Forty percent of the third-, fourth-, and fifth-grade students received free lunch.

A Description of the Children in Melissa's Class

There were 20 students in Melissa's class. Nine of them were girls. Two of the children were European-American and 18 were African-American. Sixteen of the children lived in the immediate or surrounding neighborhood. Seventy percent of the children received free lunch. All of the children's names reported in this study have been changed.

Gaining Entry into the Social Scene

After gaining Melissa's consent, I contacted the principal in the fall before the study was conducted to get her approval. Later, the appropriate central office administrators were contacted. Entry into the social scene was made after written permission was received from the teacher and central office and school building administrators.

My Role in the Social Scene

My role in the social scene was that of a participant observer. In that role, I participated enough to gain rapport with the teacher and students in order to better understand what was happening in the social scene (Borg & Gall, 1989). With the teacher's permission, I interacted

with the children during centertime. My interaction included responding to their questions or listening when they stopped me to "explain" what they were doing as I moved among them while they explored various materials in the classroom during this designated time. Often, while responding to the children's questions, I questioned them to gain additional insight into their understanding of what they were doing. I accompanied Melissa and the students on the playground daily. Additionally, I served as a monitor in the classroom during the week that the California Achievement Test was administered.

Data Collection

Data were gathered over a period of 5 1/2 months. Both observational and interview data were collected. The observational data served as the primary data source for the teacher's beliefs and practices after the in-service activities, while the interview data were the primary data source for her beliefs and practices before the in-service activities. Data were collected through audiotapes, field notes, photographs, diaries, and artifacts (Patton, 1989). Quantitative data from a questionnaire and two other classroom observational instruments were also included.

Observational Data

Observational data were collected over a 3-month period (March, April, May) through the use of field notes, audiotapes, photographs, and diaries. Artifacts were also collected. The observations were made three times per week (Monday, Wednesday, and Friday). Each observation started at 9 a.m. and ended at 12 noon.

Grand tour observations were made for the purpose of recording as much information as possible about the social scene (Spradley, 1980) during the first week of the study. The grand tour question that guided these observations was: What are the beliefs and teaching practices of a selected kindergarten mathematics specialist?

Mini-tour observations were made in an effort to give a more detailed description (Spradley, 1980) of the teaching practices of this educator during the second week of the study. Mini-tour questions that guided these observations were:

1. How is the classroom organized?
2. Are there learning centers in the classroom?
3. What kinds of materials are in the centers?
4. When do the children use the materials in the learning centers?
5. Does the teacher make use of concrete materials during her lesson presentations?

6. Is mathematics integrated with other areas?
7. Do the children use calculators and computers?
8. Does the teacher provide whole group, small group, and individualized instruction?
9. Does the teacher use a variety of teaching strategies that provide appropriate scaffolding?
10. Does the teacher use a problem-solving approach to teaching mathematics?
11. Does the teacher build on the informal mathematical knowledge of students?
12. Does the teacher relate the mathematics activities to children's lives outside of school?
13. Does the teacher provide activities that will enhance the language development of the children?

When an ethnographic study of classroom situations is undertaken, there is a large body of information amassed. Spradley (1980) and Bogdan and Biklen (1982) advocate the process of "focusing" or concentrating on identified patterns of behavior. Thus, during this phase, patterns of behavior that were identified during the previous 2 weeks became the focus of this study.

Focused observational data were gathered during the last 10 weeks. These observations were guided by structural questions. Such questions related to the previously identified patterns of behavior (domains). These questions

were answered over and over again as I continued to gather data to describe the teacher's beliefs and practices.

Field notes were the primary data source during this phase of the study. Bogdan and Biklen (1992) defined field notes as "written accounts of what the researcher hears, sees, experiences, and thinks in the course of collecting and reflecting on the data in a qualitative study" (p. 107). Handwritten field notes that were made during the observations were entered into a word processing program each day. Audiotapes of the interactions between Melissa and the children and the children and their peers were played while the field notes were being typed. This strategy allowed the events that were observed to be reconstructed which often led to more detailed field notes. In this manner, the audiotapes served as a supplement to the handwritten field notes.

On the first day of the observations, many photographs were taken of the classroom while Melissa and the children were on the playground. Additionally, many photographs were taken of Melissa interacting with the children and the children interacting with each other during the course of the 3-month observational period. These photographs were helpful in terms of providing a visual reconstruction of the events in the classroom.

Both Melissa and I kept diaries. The diaries contained our perceptions of the difficulties and the successes that

she experienced in her teaching. I also included all accounts that Melissa gave about her personal life. Conversations in which personal data were given usually took place on the playground or when the children were in the library. Field notes were not recorded on the playground. Details of such conversations were recorded as soon as I returned to the classroom. On the occasions when the children were in the library, the conversations were audiotaped with Melissa's permission. Since artifacts are material manifestations of a teacher's classroom practices (Goetz & Lecompte, 1984), copies of teacher-made and commercially-made materials were collected. I requested and received copies of Melissa's lesson plans. She kept her lesson plans in folders. She allowed me to randomly select copies of her lesson plans from the present academic year as well as the previous 7 years. The selected copies of the lesson plans for the current academic year were reviewed to see whether they were representative of the lessons that I was observing. Samples of the students' work were also collected.

Additionally, Melissa took photographs of her students while they were engaged in various activities from 1985 until 1990. She shared these photographs with me. A personal statement that was written by Melissa in 1992 was also collected. Additional information will be given regarding why artifacts from previous years were collected

(photographs, lesson plans, a personal statement) in the following section.

Interview Data

Interviews were conducted with Melissa over a period of 2 1/2 months, June through mid-August. Each interview was audiotaped and later transcribed. The interviews were held two days per week (Tuesday and Thursday) from 9 a.m. until 12 noon. Most of the interview sessions were held in Melissa's home. On a few occasions, we met in her classroom.

Spradley (1979) described the ethnographic interview as a friendly conversation in which the investigator introduces ethnographic questions to gain new information. Accordingly, many questions pertaining to life history data were asked during the interviews. These questions were intended to ascertain professional as well as personal data (See Appendix D). In fact, due to the fact that I did not observe Melissa prior to the LaSIP workshop, many questions were geared toward getting her perspective on what her teaching practices used to be.

Butt and Raymond (1989) suggested that teachers' self reports of life history data that relate to prior attitudes or beliefs should be checked against written records that were made at the time. Therefore, randomly selected samples

of lesson plans that were written by Melissa from 1985-1992 were collected to be compared to her self reports of her prior beliefs and practices. The photographs that Melissa took from 1985-1990 were also collected for this purpose.

A personal statement that was written by Melissa in 1992 when she applied for a grant to the Parent-Teacher Organization (PTO) of Clinton Elementary allowed for further longitudinal cross-checking of self reports (Butts & Raymond, 1989) of her prior teaching. Finally, Mrs. LeBlanc (pseudonym), principal of Clinton Elementary, was interviewed in order to get her perspective on Melissa's beliefs and teaching practices prior to the LaSIP summer in-service activities (See Appendix E).

As suggested by Spradley (1979), descriptive, structural, and contrast questions were asked in an effort to generate a variety of information that clarified or extended the observational data which focused on Melissa's current beliefs and practices. All questions were worded in an open-ended format in an effort to collect as much data as possible rather than a simple yes or no answer.

The LaSIP summer workshop was staffed by four faculty members. The faculty members were interviewed to ascertain their personal objectives for the workshop. They were also asked what they would expect to see if they had an opportunity to observe the LaSIP participants in their classrooms.

Interviews were conducted with two other researchers who observed in Melissa's classroom as part of the follow-up study of the LaSIP K-3 teachers (See Appendix F). These researchers observed Melissa's teaching four times during the academic year of this study. The observations were conducted in October, January, February, and May. The first observation lasted 3 hours, while the other three lasted approximately 1 1/2 hours. The instruments that the observers used to rate Melissa's teaching will be discussed later in the section on instruments. I interviewed the researchers in an effort to gain additional information about Melissa's teaching and the change process.

The interviews with the LaSIP faculty members (See Appendix G) and the two researchers were held in June of 1993. They were deliberately scheduled after the collection of the observational data to prevent my going into Melissa's classroom with preconceived ideas of what she was or should be doing.

Instruments

"Although in the past ethnographic data have been almost entirely qualitative, there is a trend in educational ethnography today to collect both qualitative and quantitative data" (Borg & Gall, 1989, p. 393). Thus, quantitative data that gave additional insight into

Melissa's teaching and the change process were included in this study.

The Teacher Questionnaire

Items in this questionnaire (Charlesworth, Hart, Burts, & Hernandez, 1991; 1993) (See Appendix C) are based on the position statement of the National Association for the Education of Young Children (NAEYC) (Bredekamp, 1987). The instrument contains two scales, the Teacher Beliefs Scale and the Instructional Activities Scale The questionnaire, which contains 30 items regarding teachers' beliefs and 31 items that were designed to inventory actual instructional practices, was completed by Melissa during her first day of the LaSIP workshop. She completed this instrument again in June of 1993. This was a year after she first completed it during the LaSIP summer in-service activities. An analysis of her answers gave me valuable insight into her beliefs and practices both prior to and after the in-service activities.

Checklist for Rating Developmentally Appropriate Practice in Early Childhood Classrooms

This was one of the two instruments that the LaSIP researchers used while observing Melissa's teaching. The checklist (Charlesworth, Hart, Burts, & Hernandez, 1991; 1993) (See Appendix A) is also based on the NAEYC guidelines (Bredekamp, 1987). It focuses on six areas. They are

curriculum goals, teaching strategies, integrated curriculum, guidance of social-emotional development, motivation, and transitions. This checklist was used during an observation that took place in October of 1992. The overall developmentally appropriateness of Melissa's classroom was rated.

A Guide for Observing School Mathematics Programs

This instrument was used during the January, February, and May observations by the LaSIP researchers. The measure (See Appendix B) was adapted from the guidelines of the National Council of Teachers of Mathematics and the Association for Supervision and Curriculum Development (Blume & Nicely, 1991). Curricular and instructional items are emphasized in this instruction. Curricular items focus on problem-solving and how mathematics is communicated. Items on instruction focus on teaching strategies, instructional activities, use of classroom space, and materials and equipment.

Analysis of Data

When using an ethnographic methodology, it is vital that analysis becomes an ongoing process, as future observations are dependent on the results of previous ones (Patton, 1980; Spradley, 1980). Accordingly, toward the end

of the first week of the observational data collection process analyses of data were made in order to identify patterns of behaviors. As suggested by Spradley (1980), domain analyses were made for this purpose. Domain analysis is a procedure for analyzing written transcripts and identifying the categories or domains of data in order to understand the world of the person being observed. Identified patterns were transferred from the field notes to a domain analysis worksheet. New patterns or extensions to old patterns were added throughout the observational process.

A taxonomic analysis was made during the tenth week of the study (Spradley, 1980). A taxonomy is a set of categories that are organized on the basis of a single relationship. During the next two weeks, I attempted to verify initial observations while also looking for "deeper" relationships within the domains. This taxonomic analysis revealed how the identified patterns of behaviors related to the whole. These relationships were preliminary findings.

However, such a large amount of data was amassed from the interviews with Melissa that was life history related that all of the domains and the taxonomy expanded. In fact, many new domains were identified. Most of them were associated with life history events.

New categories or extensions to the observational data were written on the original domain and taxonomic analysis

sheets. This allowed for easy comparison of observational and interview data. After comparisons were made, the original findings were extended.

Triangulation

"Although educational ethnography is built primarily upon participant observation, this method should be supplemented by other data collection procedures" (Borg & Gall, 1989, p. 393). Accordingly, the methodology employed in this study is eclectic because observations, interviews, and artifacts were data sources. Additionally, the results of these qualitative methods were enhanced by the inclusion of some quantitative data. Such strategies provided for triangulation of the data which enhanced the reliability of the study.

The process of triangulation was further strengthened as two other coders (doctoral students) read sections of my field notes and identified teaching beliefs and practices. The findings of these coders were similar to mine.

Lastly, in an attempt to accurately describe Melissa's life history, I shared my analysis of her beliefs and practices with her shortly after the conclusion of the interviews. Additionally, I met with her several times during the writing stage of this study and shared sections of chapters 4 and 5 with her. When chapters 4 and 5 were

completed, I gave them to her to read and invited her comments. Minor adjustments were made in chapter 4 in terms of her giving additional explanations about a few events. No adjustments were necessary for chapter 5.

Summary

The ethnographic methodology used in this study was supplemented by a life history approach. This eclectic approach was utilized in order to view possible changes in the teacher's beliefs and practices from a personal and professional perspective. Both observational and interview data were gathered. I collected data through field notes, audiotapes, and artifacts.

A kindergarten teacher with 17 years of teaching experience was selected to participate in this study. The teacher's self reports were the primary data sources for her beliefs and practices prior to the LaSIP summer in-service activities. These self reports were cross-checked with artifacts from the period. The principal was also interviewed for that purpose.

Observational data were the primary data source for the account given of the teacher's beliefs and practices after the in-service activities. The participating teacher was given an opportunity to read and comment on her life history.

CHAPTER 4

ANALYSIS OF PRIOR BELIEFS AND PRACTICES

The purpose of this study was to investigate the beliefs and teaching practices of a selected kindergarten teacher who participated in the Louisiana Systemic Initiative Program (LaSIP) summer in-service activities. This study focused on the teacher's beliefs and classroom practices both prior to and after in-service activities. Two foci guided the analysis of the data.

1. What were the beliefs and teaching practices of the kindergarten mathematics specialist prior to participating in the in-service activities?
2. Did the beliefs and practices of the kindergarten mathematics specialist change after participating in the in-service activities?

This chapter focuses on the beliefs and practices of a kindergarten teacher prior to her participation in the LaSIP in-service activities. The teacher's (Melissa) beliefs and practices are traced from various experiences that she had from elementary school to in-service education. A discussion on teaching strategies used by her during a 5-year period immediately following her initial in-service education experience is included. Then, changes that occurred in Melissa's professional and personal life are discussed. The teaching practices and beliefs that resulted

from such changes during the 2-year period prior to her participation in the LaSIP in-service activities are presented. The beliefs and practices exhibited by Melissa from 1985 through 1990 and those of 1991 and 1992 are discussed. Finally, a questionnaire that was completed by Melissa on the first day of the LaSIP summer in-service activities is analyzed.

Influences of the Past

Melissa entered the LaSIP workshop with beliefs and teaching practices that evolved from many sources. These sources included personal experiences she had as an elementary and high school student. Pre- and in-service teacher education experience and professional development opportunities were also sources of the beliefs and practices that she brought to the LaSIP workshop.

Melissa received her kindergarten, primary, and secondary education in parochial schools. Some of the experiences that she had as a kindergartner served as a catalyst for some of the beliefs that she would later have as a teacher.

> My kindergarten classroom was a huge room. There were at least 50 students. We had two teachers. I don't remember the name of one of the teachers but I'll always remember Mrs. Handy because she stood in front of the classroom with a microphone. I sat at a table in the back of the room with five other students and we colored dittos most of the day. When I began to teach, I knew that I could

> not just sit at the desk and let the students do pencil and paper activities. From my experiences as a child, I knew this was stagnant and boring.

None of Melissa's math teachers, either in elementary or high school, seemed to have had a positive effect on her. However, her beliefs regarding the need for kindergartners to learn through exploration relate to negative experiences that she had in the third grade.

> My third-grade classroom was extremely structured. We worked out of textbooks. The teacher spoke to us and we simply listened and gave it back to her. I don't remember having any problems. I mean it wasn't a struggle for me to do math, but it certainly wasn't anything exciting.

In high school, Melissa's home economics teacher had a great impact on her. She describes this teacher as being fair, soft-spoken, and kind. Additionally, she said, "Her classroom was a pleasant place to be in. I couldn't wait until it was time to go to her class. I decided that I wanted to be a teacher like her."

Melissa's desire "to be like" this teacher led her to major in home economics in college. However, as she went about her daily routine of attending classes in the Home Economics Department at Newman State (pseudonym), she stopped often to observe the preschool teachers. The preschool was located in the Home Economics Department. Although Melissa enjoyed observing how all of the preschool teachers interacted with the children, she was especially drawn to Sharon Donaldson (pseudonym). Mrs. Donaldson was the director of the preschool.

> There was something special about the lady. She accepted children for who they were. I had taken child development courses, but I saw the principles being put into action. She practiced them and I liked it.

After observing Sharon Donaldson the first semester of her junior year, Melissa changed her major from Home Economic to Early Childhood Education. Many of Melissa's beliefs and practices regarding teacher-child interaction and classroom environment are deeply rooted in her observations of and conversations with Sharon Donaldson.

> She was positive with the children. The atmosphere in the preschool was one of it's okay to make a mistake. When she worked with a child, she got on the level of the child and looked at the child at eye-level. She spoke to the children like they were human beings and she listened to them. She told me that you should give students choices. However, you have to think about those choices because you should accept whatever choice they make. So, you see a foundation was laid with Sharon Donaldson at the preschool in Newman State for much of what I did later with my students.

When Melissa graduated from college, she incorporated much of what she observed as a student at Newman State in her teaching practices. As a result, she had a great rapport with her students. However, most of her day was devoted to whole group activities. Her classroom routine consisted of storytime, music, and art activities. The use of toys and other materials, such as beads and blocks, provided many opportunities for the children to interact socially with each other. After teaching for 4 years, Melissa felt that something was missing and began to question her teaching practices.

> The thoughts behind my lesson plans were so short. The activities seemed to be a hodge podge! I was taught the philosophy of children "doing" to learn and I practiced it in my classroom. Therefore, I began to think that maybe I hadn't had enough experience or maybe I didn't know enough.

Although Melissa did have a degree in early childhood education, she had not completed all of the requirements set forth by the state for certification in this area. Thus, she had been issued a temporary teaching certificate by the state. At this juncture in her career, she decided to return to college and complete certification requirements for preschool and kindergarten. She enrolled in the School of Home Economics at Lowman State University (pseudonym). Donna Brown (pseudonym) was the director of the Lowman State University preschool.

> In her methods class we developed units and made or gathered materials to use with the units. I still have the units we developed. The units centered on such topics as the zoo, farm animals and shapes. Materials on art, music, social studies, language, and math were included in these units. As a matter of fact, this was the first time that I focused on math. Today, we call such units thematic units. However, I experienced thematic units back in 1979. Isn't it amazing, we were integrating back then with Dr. Brown. Now I think Sharon Donaldson may have had this idea in mind at Newman State, but it didn't come together like it did for Dr. Brown.

Upon completion of the coursework for certification in preschool and kindergarten in the Lowman State Preschool Program, Melissa's classroom practices changed.

> I spent more time planning and organizing my lessons around themes. The children enjoyed the activities that I presented in math, social studies, and science, as well as those in art and language. The children

> seemed to grasp new concepts better now that they were related to all subjects.

Melissa has always felt that language arts was her strong suit and continued to feel confortable planning activities in that area. She also felt comfortable planning art, music, science, and social studies activities. However, she was less comfortable preparing math lessons and over the next 5 years she embarked on a crusade to improve in this area. This crusade consisted of attending workshops and reading books and articles on mathematics and young children.

At times Melissa changes her teaching practices by adopting certain ideas she read about or was introduced to through workshop activities. She attended her first mathematics workshop in 1983. This workshop, Mathematics Their Way, emphasized the importance of questioning and estimation.

> These were new strategies for me. Even though my beliefs were heavily grounded in the hands-on approach, I realized during this session that I was more or less telling the children the answers rather than allowing them to extend their thinking. I was introduced to Unifix Cubes and pattern blocks for the first time at this workshop. Back in my classroom, I incorporated more problem-solving activities in my lessons.

Melissa purchased the books Workjobs and Workjobs II Number Activities for Early Childhood by Mary Baratta-Lorton and Developing Number Concepts Using Unifix Cubes by Kathy Richards. She also purchased Mathematics Their Way. Later, she attended workshops offered by the school district

that focused on the techniques in these books. These books and workshops were the source of many new ideas for Melissa.

> Often, I would read the books over and over again. New ideas were generated each time I read them. Sometimes, while rereading these books I would see an activity that I had said I was going to do but didn't get around to it. Other times, while reading the book for the second or third time I would see activities that could be easily adapted for use by kindergartners.

Sometimes Melissa rejected some of the views she was introduced to in workshops because they conflicted with her beliefs. One such incident relates to a workshop that focused on the book, The Workshop Way: Kindergarten Handbook.

> The theme of the workshop was "students should take a risk," however, we (teachers) were not encouraged to take a risk in our classes. The program was so structured and whenever we would ask if we could change some of the suggestions in the program, we were told that is the way the program is written. I felt that the individual differences of students were being overlooked. I felt strongly, I still do, that you have to consider the learning styles of your students and then make whatever adjustments are necessary to meet the needs of your students. The program did allow for the participation by the children in selected activities after grouptime. However, they were kept on a schedule and there was no room for flexibility. I felt that this was not enough time for the children to explore the materials. I also felt that they needed more time to discuss their discoveries with their peers and me. The program was adopted by the school system that I was working in at the time. Therefore, I had no other choice but to use it. But I did not follow it the way they said--I made changes that I thought were necessary to meet the needs of my students.

Melissa seldom selects the book, The Workshop Way: Kindergarten Handbook, from her bookshelf. She does, however, use some games that were presented in the workshop in her teaching practices. The one thing that she remembers

hearing at this workshop that she agreed strongly with is "children should take a risk and it's okay to be wrong."

A Look at Melissa's Teaching Practices and Beliefs after a Period of Self Initiated Professional Enhancement

The period of 1985 through 1990 is critical in terms of understanding Melissa's beliefs and practices before her participation in the LaSIP summer in-service activities. Her practices can be organized into three domains: teaching strategies, instructional materials, and classroom environment.

Teaching Strategies

Melissa described her teaching strategies during this period as "including a lot of hands-on activities." Additionally, she said, "I seized opportunities to pull in other parts of the curriculum into whatever I was teaching at the moment because I believe children learn best when subjects are not taught in isolation." Melissa also said, "I tried to incorporate everyday objects that the children used in their everyday lives. I also tried to include activities and games in my lessons that would enhance their excitement and their desire to learn."

Lesson plans that were written by Melissa from 1985 through 1990 were analyzed in an attempt to confirm or extend her self reports of her teaching strategies during this period (See Table 1). An integrated approach was very much in evidence in her lesson plans. Language, math, science, and social studies were incorporated in each lesson. Whole and small-group activities were also included.

Table 1

Domain Analysis of Teaching Strategies Before In-Service, 1985-90

Included Terms	Semantic Relationship	Cover Term
Integrated approach		
Whole-group activities		
Small-group activities		
Hands-on activities		
Initiated a project with 5th graders who provided one-on-one help to kindergartners	are kinds of	teaching strategies
Occasionally used photographs to show students' progress to parents		

Sorting, counting, estimating, classifying, and patterning activities were included in Melissa's weekly

instructional plans. Both standard and nonstandard measurement units were emphasized. One day the children used Unifix Cubes and paper clips to measure pieces of yarn of varying lengths. The following day they glued the pieces of yarn on paper in order from shortest to longest. Art was incorporated in the next math lesson when the children drew and cut out three bears of different heights and measured them. These measurement activities concluded with the children using a ruler to draw lines of different lengths.

According to Melissa,

> The children were anxious when they came into the classroom in that they speculated what we were going to do that day. They always looked on a small table that I sometimes kept the instructional supplies for the day on to see what was there.

Melissa continued, "I tried to include activities that would maintain their interest and ultimately result in increased learning."

A variety of interesting hands-on activities on geometric shapes was included in Melissa's lesson plans. One week, the children dipped rolls of toilet paper in paint and painted circles. The next two days they made triangles and squares with glue and toothpicks. Rectangles were made by outlining the shape with glue and filling it in with grits. These activities culminated with the children making a "book" of their pictures. Melissa planned such "hands-on" activities for numeral recognition as having the children outline the shapes of numerals with play dough and rub over

sand paper numerals with a crayon. She explained, "I used things that the children could touch, manipulate, and move, and rearrange and find in their world. They were not going to find some of the items I used like Unifix Cubes in their homes, but they could find things like pennies, bottle caps, and keys to count."

From 1985 until 1990, Melissa took photographs of the children while they were engaged in various activities during centertime. Melissa said:

> The practice of taking photographs of my students grew out of the practice of taking photographs while attending workshops. I took photographs at workshops to remember things. Then, I started taking photographs of the students in my classroom to remember some of the many activities and ideas I was collecting from many different resources.

Additionally, Melissa said, "I started displaying the photographs on the bulletin board and the children loved it."

Analysis of these photographs gave additional insight into the specific activities that were a part of Melissa's teaching during this period. In the photographs, children could be seen participating in activities such as connecting links and paper clips, sorting objects, and playing with blocks, and stringing beads and buttons. Other activities included completing number puzzles, playing with shapes, and Unifix Cubes.

Melissa said:

> I worked closely with a fifth-grade teacher during the 1986-87 school year. My kindergartners were adopted by

> her students. The fifth graders would come in and work one-on-one with my students. I thought this was an excellent way to enhance my student's language development because each student had an opportunity to talk to someone about what he/she was doing.

The photographs that were taken during the 1986-87 school year showed the fifth graders working with the kindergartners on a variety of activities. These activities included showing patterns with Unifix Cubes, completing puzzles, and sorting shapes.

While cleaning her classroom in June of 1993, Melissa found the box of photographs. She was happy that she found them and eagerly shared them with me.

> I was at school yesterday and I found my box of pictures that I have been taking since I've been at Clinton Elementary and I've been there 8 years. It was fun for me to see the children who are now in the 6th and 7th grade. More importantly, it was interesting for me to see Unifix Cubes and children working with links and bears. There were children working individually. It helped me to realize that I have been doing these things. This was a part of me, a part of my training! I'm sure my reading books and going to workshops helped. But, it has always been a part of me. I used to display these pictures on the bulletin board. There were also times when parents asked me for copies of pictures. On occasions, I used pictures to show the students's progress to parents. These pictures showed the parents that we were doing hands-on activities and I remember telling some of them this is not paper and pencil. I told many of them we do lots of things during the day but they are hands-on things. The first 6 years I was at Clinton Elementary I took pictures all of the time. I slacked off during the last 2 years. I don't know why I slacked off.

When asked to explain what she meant in the quote above when she said "This was a part of me . . . But, it has always been a part of me," she said,

> It's just with the latest training that I had--LaSIP--I guess I'm focusing on it. But these photographs reminded me that I've always used the hands-on approach, felt the importance of speaking and language and having the children express themselves, and worked with them in small and large groups. I've always used these strategies to meet the individual needs of my students. The photographs of children who are now in 6th and 7th grade just reminded me that I have been doing these things.

Instructional Materials and Resources

According to Melissa, her instructional ideas came from a variety of resources (See Table 2). She said although she used math activities from her teacher's edition of the math textbook, she relied heavily on Workjobs, Workjobs II Number Activities for Early Childhood, and Mathematics Their Way.

Melissa explained:

> I used some of the suggested activities that were included in the teacher's manual. After reading the suggested activities that were listed, I selected those activities that were appropriate to incorporate in my teaching. The activities were judged to be appropriate if they were of a hands-on type.

Melissa further explained that quite often she selected activities from Mathematics Their Way and the other instructional resources listed above that presented similar concepts in a more appropriate way than the teacher's manual did for kindergartners.

Table 2

Domain Analysis of Instructional Resources and Materials Before In-Service, 1985-90

Included Terms	Semantic Relationship	Cover Term
Used textbook occasionally Workjobs Workjobs II Number Activities for Early Childhood Mathematics Their Way	are kinds of	instructional resources and materials

The instructional resources that Melissa used were listed in her lesson plans. Often, she used activities from several different resources each week that correlated with her weekly theme.

Classroom Environment

The environment in Melissa's classroom gives much insight into her teaching practices (See Table 3). Melissa said, "I did not have tables in my classroom when I began teaching at Clinton Elementary in 1985. I arranged the students' desks facing each other in groups to make them look like tables." Additionally, she said:

> I placed a lot of emphasis on language and having the children express themselves. Therefore, I tried to

provide as many opportunities as possible for the children to interact and develop their language. This seating arrangement was needed to promote small-group activities because the children needed time to interact with their peers.

Table 3

Domain Analysis of Classroom Environment Before In-Service, 1985-90

Included Terms	Semantic Relationship	Cover Term
Students worked in small groups	are descriptions of	classroom environment
Students engaged in conversations with their peers		

Many of the photographs that were taken from 1985 through 1990 showed children working in groups in chairs that were facing each other. Some of them were in groups of two's while others worked in larger groups. There appeared to be much interaction between the children. Often, their heads were together in conversation as they worked. Interestingly, the children were so involved in the activities that they did not look up while their photographs were being taken.

The photographs that were taken during the 1986-87 academic year showed that Melissa had acquired some tables for her classroom. In one photograph, the children are

seated on the floor in a circle during whole-group activities.

Melissa's Beliefs

Melissa's beliefs were categorized into one domain (See Table 4). The practice of integrating all curricular areas related to the belief "that children learn best when subjects are not taught in isolation." The belief that children learn from each other while working in groups is evident in the way she organized the seating arrangement for the children. Clearly, desks that are pulled together will encourage more communication among students than those that are in neat little rows with space between them.

Table 4

Domain Analysis of Beliefs Before In-Service, 1985-90

Included Terms	Semantic Relationship	Cover Term
Children learn best when subjects are integrated		
Children need to work in groups	are kinds of	beliefs
Children need to talk		
A hands-on approach works		

Much of what Melissa did in her classroom was a reflection of her strong belief in a hands-on approach. She said, "I have no doubt teaching strategies in kindergarten classes should be based on a hands-on approach. Kindergartners learn by touching and handling materials." The activities in her lesson plans were all of a hands-on type.

A Drastic Change

According to Melissa, she "slacked off taking pictures of her students" in 1991 and 1992 (the 2 years prior to her participation in the LaSIP in-service activities). However, she changed in other ways, too. She described her school life as "being overwhelming" during this period. She explained that "in terms of teachers sharing ideas with each other, it was just Mrs. Brown and myself and we just ran out of fuel." (All of the grade levels at Melissa's school were departmentalized. Mrs. Brown was the kindergarten teacher with whom Melissa was paired).

However, through deeper probing of this situation with Mrs. Brown, the "we just ran out of fuel" eventually became "I got to the point where I was tired of giving and not receiving." Melissa admitted that she came to resent the fact that she gave of her time and attended various workshops while Mrs. Brown did not. She explained:

> We were working closely together, but the ideas were coming from me because her ideas would not have been compatible with my beliefs. Our ideas would not have been compatible because she was simply not keeping abreast of what was happening in education. She believed in too many pencil and paper tasks.

According to Melissa, the principal was aware of the many differences that existed in their teaching styles. In fact, she said the principal told her many times to help Mrs. Brown. Melissa said, "Feeling responsible for someone else was taking a lot out of me. I spent my Sunday afternoons away from my family writing lesson plans and she copied them on Monday. I eventually said to myself, 'she (Mrs. Brown) comes to school and does not wear herself out and she is getting her paycheck.'"

This unresolved conflict that Melissa experienced with one aspect of her school life eventually affected life in the classroom. She said that she simply "got tired of doing the right thing." She began to feel that she could no longer provide a classroom environment where the students "were working at their own rate with hands-on activities" by herself. She felt that she needed a teacher aide in the classroom to help her with this task. Ironically, the number of students that Melissa had in her classroom at this time was comparable to the number she had in previous years. Additionally, Melissa began to focus on what the students could not do rather than build on what they could do.

> So even with the hands-on background, over the years it got overwhelming because I had 24 students and I did not have an aide or anyone helping me. The children

> that I was working with at this time--I mean, developmentally many of them were functioning at a 3-year-old level mostly because they had never had any experiences prior to this. They did not have anyone reading or playing games with them. So, the majority of my students came to kindergarten and this was the first learning experience for them. It was like teaching 3-year-olds not 5-year-olds and I was tired and had to kind of pull back.

However, according to Melissa's principal, there was no significant difference between the kindergartners that were enrolled at Clinton Elementary during this period and those enrolled previously. The principal said, "Most of our kindergartners are from the immediate or surrounding neighborhood. The racial composition is usually around 95% African-American and 5% European-American. Approximately 90% of them receive free lunch each year."

At the Crossroads: To Quit or to Continue Teaching

Melissa describes herself as having an "I quit attitude--I felt like giving up. I felt like I should not beat myself to death when I was not getting a response." According to Melissa, her attitude was not directed toward the children but their parents for what she called "their lack of concern and involvement with their children's education." Melissa had very strong feelings toward the parents of her students for what she perceived at the time as "so many students who were developmentally lower." Additionally, she said, "I had to deal with so many levels

in my classroom. There were big gaps between the children." Although this may not have been Melissa's intention, her students were affected by her demeanor as she describes her teaching practices at this time "as being very structured with less hands-on activities and more pencil and paper assignments." She explains using such strategies by saying "I fell into the rut of keeping it very, very structured because it was the only way I felt I could organize things and have a little control."

However, Melissa was not very happy about her teaching during this time. She describes her state of mind by saying "I was not feeling good about myself when I started teaching this other way. It was very tough for me. The conflict within me between what I believed and what I was doing made me think about quitting teaching." Additionally, she said:

> I wanted to quit real badly. I thought about going back to school to study accounting because I wanted a job where I could go and do my job and leave without having to think about it until the next day.

Melissa was seriously considering making a career change from teaching to accounting when her sister, a principal at an elementary school in the school district, suggested that she request a sabbatical instead. Melissa's sister Janice had always been very supportive of her. Mrs. LeBlanc, Melissa's principal, spoke of this support during my interview with her. Mrs. LeBlanc knows Janice well, as they were co-workers at a local elementary school before both were appointed to principalships. According to Mrs.

LeBlanc, Janice "talked about her sister a lot and often bought instructional materials that she thought she could use in her kindergarten class."

Problems in Her Personal Life

As Melissa pondered whether to request a sabbatical or change careers something happened in her personal life. After 17 years of working in banking and being the primary source of financial support for his family, Melissa's husband Bill was fired from his job. Melissa's salary was now the primary means of support for the family. She realized that financially their lives had changed drastically and she would have to "carry on." She "carried on" by continuing to teach. She did not request a sabbatical.

For the first few months after Bill lost his job, Melissa felt "he was not sharing a lot with me. He kept his feelings inside. During this period, I missed the support that I had always gotten from him." This support started in college.

> We were married when I was in college. One night, I was writing my lesson plans. I also planned to make a puppet to use during the lesson. I will never forget this incident because I tend to get upset when I have several things to do. Bill is just the opposite in that he slowly takes everything one step at a time. So, here I was with lesson plans to write and a puppet to make. While I worked on my lesson plans, he volunteered and sat down with my sewing box and sewed hair on each finger of a glove and made a puppet. I

> wish I could find that puppet because that was a very special time for Bill and me. That's when I knew that he was going to be a part of my teaching. He has remained a part of my teaching. Over the years, he has gotten to know the children in my class. I've often taken children home with me.

Bill's support of Melissa even extended into the classroom. He helped her get her classroom ready for the beginning of school each year. Melissa's principal, Mrs. LeBlanc, commented that she was "surprised" when she arrived at school one morning in early August of her first year at the school and found "Melissa's husband working in her room." Additionally, Mrs. LeBlanc said:

> He painted her bookcases, moved furniture, and helped with the bulletin boards. He worked in her room for several days. In all my years in education, I have never seen a husband who is so helpful to his wife in her classroom. He has helped her get her room ready for school every year since I have been here as principal.

Melissa felt that she had to be "strong for Bill" now because he had always been there for her. However, she said, "My life had changed completely. My husband was hurting and I would have given anything to experience the hurt for him, but there was nothing I could do."

She admitted that her teaching continued to suffer as a result of the unresolved problems in her life. She said:

> I was negative. I didn't like myself at all and I felt sorry for the children who had me as a teacher. There were times when I felt that I wouldn't want my daughter, who was in the first grade at the time, to have a teacher who acts this way.

I was taken aback by Melissa's candor, but felt privileged that she felt comfortable enough to reveal these

private reflections with me. She cried each time she told me about Bill losing his job. She was also quite upset when she shared her feelings about her teaching during this period. She talked freely about the problems in her personal life. However, it was more difficult for her to talk about "teaching this other way" and these details evolved during the course of the interview period.

As was previously stated in this chapter, Melissa described her students as being "developmentally lower" during the period when she was "teaching this other way." However, toward the end of the interview process Melissa admitted that she was responsible for the children's lack of confidence. She said:

> I didn't motivate them as much as I had motivated my students in the past. I was not able to because I was so wrapped up in my personal situation. Children can read you well. Their lack of confidence reflected by lack of enthusiasm about my teaching.

Melissa further stated, "I'm not proud of my teaching during that period." Details of her "teaching this other way" are given in the following sections.

A Description of Melissa's Teaching During A Time of Personal and Unresolved Professional Problems

After 14 years of teaching, Melissa was beset with both personal and professional turmoil in 1991 and 1992. The teaching practices that she exhibited during this time can

best be categorized into three domains. The domains are: instructional strategies, instructional resources and materials, and classroom environment.

Instructional Strategies

This section describes Melissa's teaching strategies during the 2-year period prior to her participation in the LaSIP summer in-service activities (See Table 5).

According to Melissa, her style of teaching was very structured. She said, "I was too overwhelmed to get everything ready every day. So, I placed them (the children) at the tables most of the time and they did a lot of dittos." An analysis of her lesson plans indicated that the use of worksheets and workbooks was in evidence. Most of the worksheets included activities on phonics or handwriting.

In fact, the theme that was common across all subject areas was the letters of the alphabet. For example, one week "a" was the letter of the week. After discussing the short "a" sound, the children practiced forming the letter "a." The math lesson focused on counting. The children counted how many of each type of animal cracker was in their box. Finally for science, Melissa read the book, Ants Underground.

Table 5

Domain Analysis of Teaching Strategies Before In-Service, 1991-92

Included Terms	Semantic Relationship	Cover Term
"Very structured"		
Used worksheets		
Used workbooks		
Placed a lot of emphasis on phonics		
Placed a lot of emphasis on handwriting	are kinds of	teaching strategies
Did not teach math daily		
Little small-group instruction		
Teacher-centered		
Little student interaction		

Many of the activities that Melissa planned for mathematics involved worksheets also. Counting, recognizing various coins, estimating, and using standard units of measurement were some of the mathematical concepts that she emphasized during this period. Often, mathematics lessons were not taught on a daily basis. The only math lesson planned for "d" week focused on the recognition of a dime.

This lesson was preceded by a discussion on the letter "d" and a handwriting activity.

Melissa said when she tried to work with groups, the children who were supposed to be working independently asked thousands of questions. She explained, "the students had no self direction and I had to go very slowly in explaining centers to them because they really did not know how to handle them."

Mrs. LeBlanc, principal of Clinton Elementary, described Melissa's classroom as being primarily teacher-centered. She said there was little interaction between the children. Mrs. LeBlanc said:

> Melissa wanted very much to be in control while teaching. She used manipulatives while presenting whole-group instructions, but she did not allow the children to explore them. Instead, she wanted the children to sit at attention and observe while she handled them."

Instructional Resources and Materials

Melissa's description of her instructional resources and materials gives much insight into her teaching practices during this period (See Table 6). She said:

> I don't know why, but I used the textbook a lot and I followed it chapter by chapter. In fact, when I wrote my lesson plans, I would think I have already taught this so I had better not write that up again. Developmentally appropriate teaching takes a lot of energy in terms of planning and gathering materials and I just did not have the energy during this time. Instead, I followed the textbook chapter by chapter and

> I did not get around to teaching those concepts that were in the back of the book.

Therefore, the teacher's edition of the mathematics series being used was the primary determinant of her teaching practices. Additionally, the sequential placement of the chapters in the textbook often guided her weekly planning.

According to Melissa, the suggestions for hands-on activities that were included in the textbooks were incorporated in her math lessons. However, she readily admits that she included "many dittos and workbook pages also."

Table 6

Domain Analysis of Instructional Resources and Materials Before In-Service, 1991-92

Included Terms	Semantic Relationship	Cover Term
Followed textbook chapter by chapter		
Amount of pages in textbook controlled the amount of time spent teaching the skill		
Use of "hands-on" activities controlled by suggestions in textbook (by teacher in demonstration format)	are examples of	instructional resources and materials
Teacher's editions and children's literature were the only teaching resources used		

She listed the resources she used for instructional ideas in her lesson plans. These resources included her reading and math textbooks and children's literature books. No other mathematics resources were listed.

As Melissa recounted her teaching practices of this period when she was "teaching this other way," she said:

> I don't know where I got the notion from that once you teach a chapter you don't have to teach the concepts in that chapter again. I knew better, I knew better. I knew that children have to experience things over and over again. But, I guess what I was going through in my personal life made me put all of my beliefs in the background. This change in our lives was like a death or a major move.

Classroom Environment

Melissa gave detailed information on her classroom environment during this 2-year period (See Table 7). She said that she found herself "yelling at the children all of the time" but, she didn't know what was wrong. She simply knew that she "did not recognize this person." The principal did not say anything to Melissa about her voice tone, therefore, she does not know if the principal noticed it. However, two of her co-workers did notice. One of them, the guidance counselor, came in her class one day and said, "We have parents visiting this school." Melissa was offended by the guidance counselor's reprimand. Although she did not respond to the guidance counselor, Melissa said she felt like telling her, "You are not in the room with 24

students all day long. Why don't you come in here and sit with them and see how I feel."

Table 7

Domain Analysis of Classroom Environment Before In-Service, 1991-92

Included Terms	Semantic Relationship	Cover Term
"Yelled at students all of the time"	are explanations of	classroom environment
"Very structured"		

The other co-worker who approached Melissa about her yelling at the children was the speech therapist, Mrs. Rollins (pseudonym). Mrs. Rollins had worked with Melissa 15 years earlier at another school. Melissa remembers Mrs. Rollins walking in her room and saying to her one day, "I know you and Bill are going through a lot right now, but the way you are treating these children--it is just not you."

Melissa's reaction to Mrs. Rollins was quite different from her response to the guidance counselor. She said, "When Mrs. Rollins approached me, I thought, 'she's right, she's right.'" Melissa was not upset with the speech therapist because she felt that she was genuinely concerned about her. She also felt that Mrs. Rollins was concerned about the children. Melissa had a great deal of respect for the way Mrs. Rollins conducted herself around the children

at Clinton Elementary. In fact, she had never seen her "yell at a student or put a student down."

According to Melissa, this incident occurred during the spring of 1991. She said, "Mrs. Rollins helped me by telling me that I was treating the children badly." However, while she admits that the practice of yelling at the children ceased, other practices did not change. She described her classroom practices as "still being very structured."

Suppressed Beliefs

While analyzing the data, I identified Melissa's beliefs for this tumultuous period as: (a) children should be controlled and (b) children are passive learners. However, when I showed her the domain analysis of her beliefs, she admitted that her practices changed but viewed her beliefs differently. Her reported beliefs can best be categorized in one domain (See Table 8). She said:

> I don't think my beliefs changed during this time. I really think I suppressed them. I put them in the background. When I started having problems in my personal life, I pushed my beliefs about teaching further in the background. I just reached a point where I said I know this is right and everything but I'm just tired of doing it. My practices were different but my beliefs did not change. There is just no way they changed. My beliefs are instilled deeply in me because of my experience at Newman State and Lowman State University and subsequent reading and workshop attendance.

Table 8

Domain Analysis of Beliefs Before In-Service, 1991-92

Included Terms	Semantic Relationship	Cover Term
"A hands-on approach works"		
"Children learn from their peers"	are kinds of	beliefs
Children need to talk		
Children learn best when subjects are integrated		

Melissa indicated that the battle that was going on inside between her "suppressed beliefs" and teaching practices resulted initially from the unresolved conflicts at school and then her personal problems. She said:

> I believe there are two factors that made me push all of my beliefs in the background and ignore them for a few years. I was not happy those few years because of the problems in my school and personal life. My personal problems really put me in a tailspin. If I had continued like that I would have had to quit teaching because that wasn't me. That was not my way of teaching because a hands-on approach works, it works. Also, I may not have shown it in my teaching but I never stopped believing that children learn from their peers while they are in groups, they need to talk, and they learn best when subjects are not taught in isolation.

A Taxonomic Summary of Melissa's Beliefs and Practices Before the LaSIP In-Service Activities: Interviews and Artifacts

A taxonomic analysis (Spradley, 1979) revealed two distinct periods in Melissa's teaching, 1985 through 1990 and 1991 and 1992 (See Table 9). Her beliefs remained the same. However, she stated that she "suppressed" her beliefs in 1991 and 1992. Significant differences were found in her teaching strategies and classroom environment. There were also notable differences in the instructional resources and materials that she used.

A Mixed Signal

During the spring of 1992, Melissa was still in a state of turmoil about her teaching. However, further analysis revealed that when she wrote about her teaching strategies, she described those "suppressed" beliefs and practices that were last in evidence two years earlier. Consequently, her written account is quite different from what was really going on in her classroom at that time. In an application for a grant to the Clinton Elementary PTO Melissa wrote:

> I believe learning is a complex process that occurs when the young child interacts with materials and people. As a teacher of young children, I act as a facilitator preparing the classroom to meet the needs of my students. Each child is viewed as an individual with various learning styles practiced. I listen,

Table 9

Taxonomy of Beliefs and Practices Before In-Service Activities: Interviews and Artifacts

TEACHING (during two significant periods)	**1985 to 1990**	**BELIEFS**	Children learn best when subjects are integrated Children need to work in groups Children need to talk A hands-on approach works
		PRACTICES	**Teaching Strategies**
			Integrated Approach Whole-group activities Small-group activities Hands-on activities Initiated a project with 5th graders who provided one-to-one help to kindergartners Occasionally used photographs to show students' progress to parents
			Instructional Resources and Materials
			Used textbook occasionally Workjobs Workjobs II Number Activities for Early Childhood Mathematics Their Way
			Classroom Environment
			Students worked in small groups Students engaged in conversations with their peers
	1991 to 1992	**BELIEFS**	"A hands-on approach works" "Children learn from their peers" Children need to talk Children learn best when subjects are integrated
		PRACTICES	**Teaching Strategies**
			"Very structured" Used worksheets Used workbooks Placed a lot of emphasis on phonics Placed a lot of emphasis on handwriting Did not teach math daily Little small-group instruction Teacher-centered Little student interaction
			Instructional Resources and Materials
			Followed textbook chapter by chapter Amount of pages in textbook controlled the amount of time spent teaching the skill Use of "hands-on" activities controlled by suggestions in textbook (by teacher in demonstration format) Teachers' editions and children's literature are only teaching resources used
			Classroom Environment
			"Yelled at students all of the time" "Very structured"

> observe, and interpret children's behavior. This allows me to provide a variety of activities, materials, and equipment. I extend children's learning by asking questions or making suggestions that stimulate their thinking always accepting that there is often more than one right answer. We work individually or in small groups using cooperative learning activities. My classroom is a positive learning environment and a place for enhancement of self-esteem. The children are shown respect and are accepted regardless of their behavior. I use a management program that clearly sets fair limits for classroom behavior while fostering the development of self-control.

The beliefs that Melissa wrote about during the time of personal and professional turbulence in her life are congruent with those that she held during an earlier time of contentment. The teaching practices described here were also displayed during that same earlier period.

Analysis of Questionnaire

Melissa was asked to complete the Teacher Questionnaire (Charlesworth et al. 1991; 1993) on the first day she attended the LaSIP summer workshop (See Appendix C). The questionnaire was given to obtain an understanding of the beliefs and practices that she was bringing to the workshop. The questionnaire is based on a position statement on developmentally appropriate practice for 5- through 8-year-olds by the National Association for the Education of Young Children (Bredekamp, 1987). It contains two subscales, a Teacher Beliefs Scale and an Instructional Activities Scale.

The Teacher Beliefs Scale is divided into developmentally appropriate beliefs and developmentally inappropriate beliefs. A 5-point scale is used to rate these items as follows: Not Important at All (1), Not Very Important (2), Fairly Important (3), Very Important (4), and Extremely Important (5).

Interestingly, Melissa rated those items that were comparable to the teaching practices she exhibited in her classroom in 1991 and 1992 as inappropriate. Examples of such items included children working alone and silently, using workbooks and dittos and providing instruction in the recognition of the single letters of the alphabet isolated from words. Melissa's mean score for these and other similar developmentally inappropriate beliefs was 1.923. Thus, she rated the developmentally inappropriate beliefs on the questionnaire as "not very important."

The questionnaire contains such developmentally appropriate items as math needs to be integrated in all curricula areas and kindergartners learn through active exploration as well as interaction with other children. Melissa rated the developmentally appropriate beliefs items as "extremely important." Her mean score on these items was 4.923.

The Instructional Activities Scale of the questionnaire contained items on developmentally appropriate and developmentally inappropriate practices. These items are

rated on a 1 to 5 points scale with the following representations: Almost Never (1), Rarely (2), Sometimes (3), Regularly (4), and Very Often (5).

Melissa indicated that she "rarely" assigned worksheet tasks to her students. Additionally, she indicated that she did not plan activities that required her students to sit for long periods of time. Her mean score for the inappropriate activities was 2.077, which indicated that they "rarely" occurred in her class.

Developmentally appropriate practices items, such as the need for children to play games and puzzles and cut their own shapes, are included in the Instructional Activities Scale. The importance of the incorporation of mathematics in other subject areas is also included. Melissa rated these and other comparable items as occurring "regularly" in her classroom. Her mean score for these items was 4.357.

The choices that Melissa selected as being representative of her beliefs and practices on the questionnaire in June of 1992 were not congruent with the oral descriptions of her teaching strategies that she and her principal gave later. They also differed from the strategies included in her lesson plans during the period in question, 1991 and 1992.

Summary

Melissa's teaching beliefs and practices have been impacted by a variety of experiences. These experiences include events that occurred in primary, high school, pre- and in-service education, and that transpired outside of her academic life.

The "hands-on" approach has always been a pertinent part of her teaching. As she broadened her knowledge of various teaching strategies through self-initiated professional development, her instructional approach also reflected the incorporation of integration of all subject areas.

After 14 years of teaching, unresolved conflicts at school complicated her life and she pondered changing careers. Melissa's life was further complicated by personal problems. Her teaching changed significantly during this period of turmoil.

Melissa's teaching is intertwined with her personal life. Her husband has always been supportive of her teaching. When this support decreased during a time of professional and personal crises, her teaching strategies eroded further.

While there is much evidence that Melissa's teaching strategies have regressed, in personal accounts and a questionnaire she continues to identify her beliefs and

practices as those that she exhibited prior to this period of personal and professional turmoil. Thus, Melissa enters the LaSIP in-service activities relating to "suppressed beliefs" and practices that would be categorized as developmentally appropriate, while those she most recently displayed can best be labeled developmentally inappropriate.

CHAPTER 5

CURRENT BELIEFS AND PRACTICES

This study investigated the beliefs and practices of a kindergarten mathematics specialist both before and after in-service activities. The Louisiana Systemic Initiative Program (LaSIP) Summer Mathematics Workshop was the in-service activity that she attended.

This chapter focuses on the teacher's beliefs and practices after she participated in the LaSIP activities. It begins with a brief description of LaSIP that includes the objectives of the staff members. (A more detailed explanation of this program was given in chapter 1). A brief update of Melissa's personal life is included. A description of her classroom is given. Then, her beliefs and practices are discussed. Melissa's reflections on past practices are included. Two other researchers who were affiliated with the LaSIP summer in-service activities observed Melissa four times during the academic year following the workshop (See Appendices A and B). Their perspectives of her teaching will be included. Both Melissa's and the researcher's diaries will be analyzed. Finally, responses given by Melissa one year later to the same questionnaire (See Appendix C) that she first completed at the beginning of the summer workshop will be analyzed.

The Louisiana Systemic Initiative Program
Summer Mathematics Workshop

The Louisiana Systemic Initiative Program (LaSIP) provided in-service activities in the area of mathematics to 30 participants for 6 weeks during the summer of 1992. The 30 participants were kindergarten and primary-grade teachers.

The LaSIP workshop focused on improving the teachers' understanding and knowledge of mathematics and developing a better understanding of child development and early learning as they apply to K-3 mathematics instruction and assessment. Mental math, estimation, geometry, statistics, and probability were some of the mathematics content emphasized. The child development content included how learning takes place, cognitive growth and development, and concept development. Portfolio assessment was stressed. All of these topics were integrated and interwoven with the use of manipulatives and technology. Problem-solving was also included in all of these topics.

The LaSIP workshop was staffed by four faculty members. Each staff member was interviewed to ascertain his/her individual objectives for the workshop. The objectives were:

1. To encourage teachers to become familiar with the Standards developed by the National Council of Teachers of Mathematics (NCTM).
2. To promote the incorporation of the Standards in their teaching.
3. To promote the idea of math as discourse and therefore there is value in having discussions in math classes. These discussions should occur among students in small groups as well as between students and teacher.
4. To change the long-standing view that math is a right versus a wrong way of thinking.
5. To encourage the teaching of math in context.
6. To encourage teachers to present math activities to their students that are both challenging and developmentally appropriate.
7. To promote the understanding of how young children learn and develop and how that applies to their mathematics teaching practice.
8. To advance the understanding and development of skills in developmentally appropriate practices, especially portfolio assessment.
9. To promote the connection between developmentally appropriate practice and classroom management and organization.

One of the LaSIP staff members and a graduate student observed all of the participants for the purpose of gathering data for another study. Additional details will be given on their evaluation of Melissa's teaching later in this chapter. The other LaSIP staff members were asked, if they had an opportunity to observe the participants, what would they would look for? Their responses were:

1. Children who are enjoying math.
2. Problems being presented to the children that were challenging them.
3. Student/student interaction as well as teacher/student interaction.
4. Teachers who are facilitators.
5. A student-centered climate.
6. Individual, small, and whole-group instruction.
7. Use of manipulatives.

A Biographical Update

In light of all of the professional and personal problems that Melissa experienced before the LaSIP in-service activities, a brief biographical update is necessary. Three years have passed since her husband (Bill) was fired from his job. Melissa said:

> Financially, life is not much better. Bill is now working in sales, and it takes time to build up a business that is client-based. But time has passed since he was fired and with time came healing or the

> ability to cope better. So, I'm handling it better now. It's not as overwhelming as it was before. It is still not easy, however. He (Bill) is still struggling with his career change. But time has helped me realize that I'm still going to get up and go on with life.

A Description of the Classroom

Melissa's classroom was very large. A chalkboard extended across the front of the room. Samples of students' work were displayed on one-half of the board. The samples included drawings of geometric shapes, sponge number imprints, sheets on which the students recorded their results after spilling two-sided coins, and sheets on which they had written their names. The following books that have math themes were displayed on the chalk tray.

1. The Bear's Counting Book by Robin and Jocelyn Wild
2. Ten Little Mice by Joyce Dunbar
3. Ten, Nine, Eight by Molly Bang
4. Spot Learns to Count by Eric Hill
5. The Strawberry Counting Book by Richard Hefter
6. One White Crocodile Smile by Richard Hefter
7. The Teacher Who Could not Count by Craig McKee and Margaret Holland
8. How Many Snails? by Paul Giganti, Jr. and Bill Oakes
9. 1 2 3 for the Library by Mary E. Little
10. What Comes in 2, 3, & 4? by Susan Aiken

Four student desks were facing each other on the left wall in the front of the class to facilitate group activities. A single chair was placed in front of the chalkboard and often served as the area where students gathered to "play school" during centertime. (The children explored and interacted with various materials in the classroom at this time.) An easel with a number chart and an overhead projector were near the right wall. The rest of the space in the front one-third of the classroom was devoid of furniture or equipment. Melissa and the students gathered in this space in a circle during whole-group activities.

Two rectangular tables and three round tables with students' chairs, Melissa's desk, a bookcase, and the home and computer centers occupied the rest of the floor space. Melissa's desk was in the back of the classroom to the right wall. A bookcase sat perpendicular to the home center. It contained many children's books.

Two bulletin boards were in the back of the classroom. One board contained a display on shapes. The other board had a picture of each student in the classroom.

There was a lot of storage space in this classroom. A closet was in front of the class near the overhead projector. Cabinets were built over the sink on the right wall. Several shelves were on the right of Melissa's desk. Many math materials were on these shelves. These materials

included rulers, dominoes, tangrams, attribute tiles, number puzzles, and many games. The games were on counting, sorting, shapes, and money.

Many other math materials were on the counter on the left wall and the shelves on that side of the room. An abacus, scale, number stairs, counting scale, sponge numbers, and geoboards were on the counter. Other materials were stored in "tubs" on the shelves. These "tubs" contained blocks, counters (bears, beads, links, dinosaurs), and 2-sided beans and chips.

After grouptime, the "tubs" and games became learning centers in the classroom. They were placed on tables, desks and the floor. The children were able to select materials from the centers to interact with and explore. Additionally, Melissa placed materials such as the geoboard in centers after introducing them to the children.

Melissa had a very warm relationship with her students. While engaging in various activities, she got down on their level. For example, when the children sat on the floor, she sat on the floor with them. She laughed a lot with the children and they were eager to show her what they were doing. Thus, the overall ambience of the classroom was one of exploration with much interaction between the students and their peers and the students and Melissa.

Melissa's Beliefs

Melissa's beliefs after the in-service activities can best be organized into two domains. The domains are: how children learn and her role as a teacher.

How Children Learn

A popular Chinese proverb was posted on the wall in the front of Melissa's classroom that I came to believe, during the observational process, was representative of her beliefs about how children learn. The proverb states:

I hear, and I forget
I see, and I remember
I do, and I understand

Later, during the interviews, I asked her why she posted the proverb. She replied, "When I saw it, I thought, 'This is it! Here it is in print! This is what I believe.'" This section contains all of her implied and confirmed beliefs about how children learn (See Table 10).

The Hands-on Connection

Melissa believed that kindergartners learn best in a classroom environment that provides a hands-on approach. Embedded in her beliefs about a hands-on approach is the

Table 10

Domain Analysis of How Children Learn After In-Service

Included Terms	Semantic Relationship	Cover Term
They need to explore and manipulate materials (hands-on approach)		
They need to talk about what they are doing	are kinds of	beliefs about how children learn
Children should be actively involved in learning		

view that young children construct knowledge by actively exploring materials and interacting with people in their environment. Thus, she provided many opportunities for the children to handle and explore a variety of materials during her daily classroom schedule.

She incorporated many hands-on activities in her whole-group activities. For example, she used two-sided chips to introduce the children to addition. She began by telling the children to count the six chips as she placed them in the cup. She explained that she was going to shake the cup and then spill the chips. After doing this, she told the children that she wanted them to notice how many chips fell out yellow and how many fell out red.

She continued by asking the children if they could tell her "a story" about the chips. One student said, "Three fell out red and three fell out yellow and six fell out altogether." All of the students were given an opportunity to spill the chips from the cups and tell their "stories."

Later, Melissa showed the students how to record their results. She told them to draw six circles and color them yellow or red. Eventually, the children played this game with quantities other than six. Interestingly, they became very familiar with the basic addition facts as they played the game (See Figure 1). Often, after answering various questions, they related knowing the answer to playing with the two-sided chips. Once, when Melissa asked, "What can you tell me about 6?" Cortland replied, "4 + 2 = 6, I know that because I got 4 red chips and 2 yellow chips the other day."

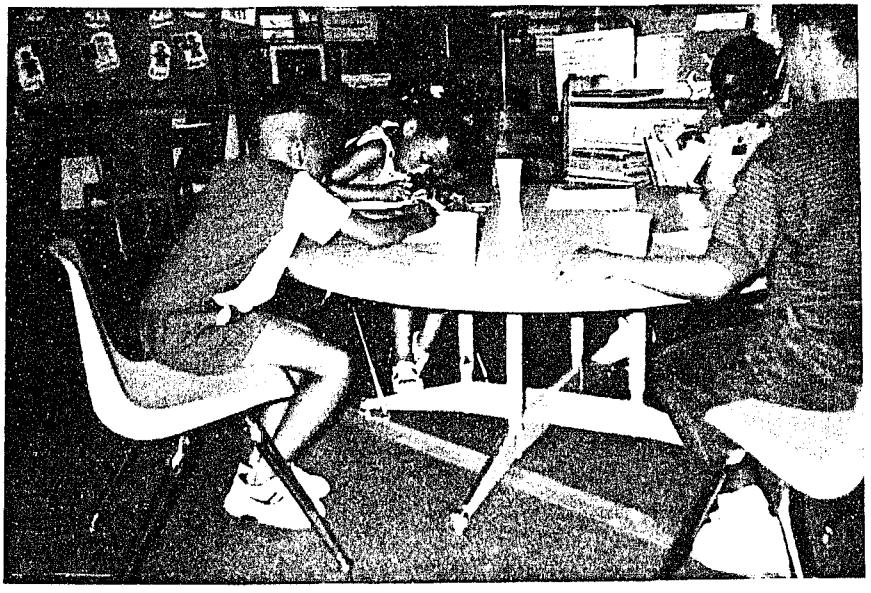

Figure 1. Playing with 2-sided chips

The Language Connection

Melissa believed that the learning process of kindergartners is enhanced by opportunities for self-expression which leads to increased language development. Hence, she provided many opportunities for the students to talk to her and to each other. Frequently, after centertime, she gave the children an opportunity to tell her and their classmates about the activities they participated in. She often used the information given by the students, during the informal conversation, to review previously learned concepts.

During one discussion, Kimberly said, "I put pattern blocks in a row from left to right," Melissa asked, "What kind of a line is that?" Many of the children replied "horizontal." Another day, Shantrell reported, "I made a square on a geoboard." Melissa asked, "Can you tell me something about the sides of a square?" Allee responded, "They are all alike." Melissa then asked, "What do you mean they are all alike. Are they all blue?" Allee replied, "They are the same length."

Melissa also encouraged the children to use correct terminology while describing their activities. When Tony said, "I was playing with that stuff that lives in water." she said, "Tony, tell me what that stuff is. You can tell me." Tony replied, "I was playing with octopuses, crabs, and sea horses."

The children were usually eager to participate in these informal conversations. Melissa encouraged them to express themselves by accepting what each child had to say. Often, she said, "Say whatever you want to." On those few occasions when one or two of the students were hesitant to speak, she did not pressure them for a response.

Children Need to Be Actively Involved in Their Learning

For Melissa, knowledge does not flow from the teacher to students who passively receive it. She extended an invitation to her students to join in and actively engage in the learning process. She listened carefully to the comments that the children made during lesson presentations. Consequently, she often took her cues from the children and expanded the lesson to include a concept that came up during the discussion.

One day, she and the children were discussing whether a single potato is heavier than a bag of potatoes. Melissa placed a potato in one of Jan's hands and a bag of potatoes in the other. When she asked which was heavier, Jan looked at her classmates and laughed and said this one, while pointing at the potato. Melissa said, "Jan is tricking me." She continued by saying "boys and girls, we are teasing. This bag of potatoes is heavier than one potato." The children replied, "There's lots of potatoes in there." Immediately, Melissa extended the lesson to include the math

concept estimation. She said, "Now wait a minute, we gotta do an estimation!"

Hence, Melissa's lesson presentations were not carved in stone. She listened carefully and incorporated mathematical concepts as they were alluded to by the students during discussions.

Role as Teacher

Melissa viewed her role as teacher in many different ways (See Table 11). The beliefs that she held that related to her perception of her role as teacher will be discussed in the following sections.

Table 11

Domain Analysis of Role as Teacher After In-Service

Included Terms	Semantic Relationship	Cover Term
To set up a classroom that supports individual differences and learning styles of students Facilitator To make learning meaningful to the students To provide a classroom environment where students will take risks	are kinds of	teacher roles

Organization of Classroom

She believed that setting up a classroom that supported the individual interests and learning styles of her students was a major responsibility. The layout of her classroom helped her to accomplish this goal. The arrangement of the furniture and the accessibility of a variety of materials provided the children with many choices. These choices included opportunities to work alone or collaborate with friends (See Figures 2 and 3).

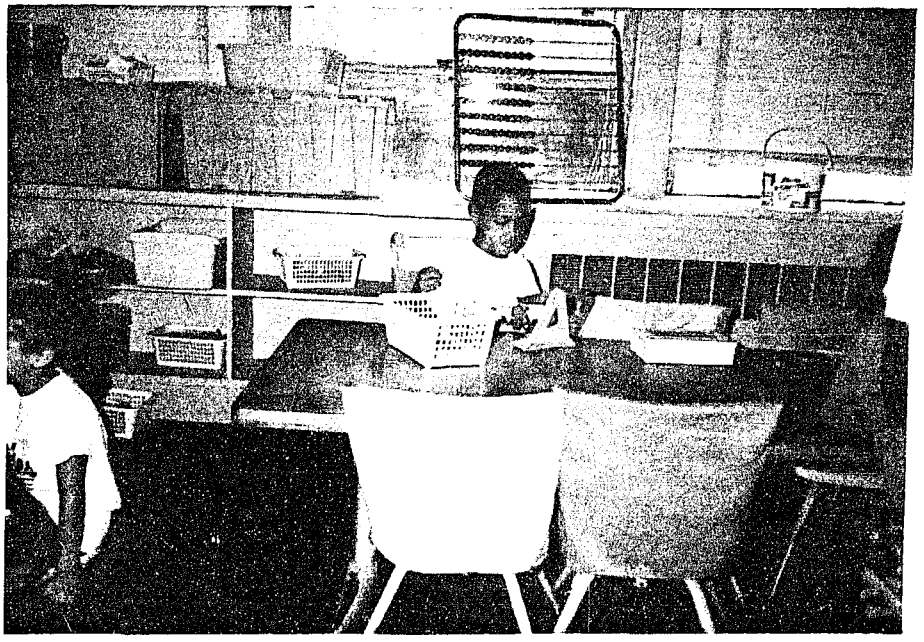

Figure 2. Balancing a number scale

Figure 3. Tessellating

Facilitator

As the children explored the various materials during centertime, Melissa's belief that her role was that of a facilitator in the learning experiences of the children was evident. She was constantly observing the children as they engaged in various activities as well as listening to their conversations in an attempt to facilitate their construction of knowledge.

In one such case, Jan and Jeffrey were playing with Unifix Cubes. The following dialogue shows how Melissa

seized the moment to expand the children's knowledge of counting.

Melissa: What are you making?

Students: We made "trains" of tens.

Melissa: How many trains did you make?

Students: 10.

Melissa: Do you know how many Unifix Cubes you have?

Students: No.

Melissa: Let's find out.

Melissa walked over to the cabinet and took a Unifix track out. The children had not been introduced to the Unifix track. Unassembled, the track was separated into links of 10's. Additionally, the links were either gray or white. As Melissa helped the children assemble the track, she asked questions that related to the children's knowledge of number and pattern to accomplish this task. Such questions included "Do you know what comes after forty?" and "Look at the links, do you see a pattern?--Which color do you think comes next?" After the track was assembled, Melissa asked the children what number the track stopped on. Jan and Jeffrey replied, "100." She then asked Jan and Jeffrey how many cubes were in each "train." When they replied "10," she suggested that they place the 10 "trains" on the track. As she and the children placed each "train" on the track, they counted by 10's. When they finished,

Melissa asked how many cubes were in the 10 "trains." The children said, "100."

Mathematics and the World of Children

Melissa related mathematical concepts to such items in the children's world as their eyes, ears, and playground equipment. She associated skip-counting with eyes and ears. She related a balance scale to a seesaw. She taught patterns by having the children sit in the circle in a boy-girl order or by having some students stand or sit (See Figures 4 and 5). Evident in these practices is the belief that it was her responsibility to make learning meaningful for the children.

Figure 4. Teaching Patterns: boy (standing), girl (sitting)

Figure 5. Teaching Patterns: boy - girl

One day, before presenting a lesson on measurement in which the children were going to weigh a variety of objects, Melissa introduced the balance scale by asking the children if they had noticed anything on the playground that looked like the scale. Many of the children said "yeah, a seesaw." Then, she guided the children's understanding of how a balance scale works by leading them to make connections between their prior knowledge about the seesaw and the scale. The following dialogue occurred.

Teacher: What happens on a seesaw?

Students: You go down and come back up.

Teacher: What happens if Tony gets on the seesaw and no one is on the other side?

Students: He goes straight down.

Teacher: Tony, if you want to go up, what do you need?

Tony: I'll need a friend.

Teacher: Okay, you'll need someone to get on the ---

Students: Other end.

Teacher: Now, what happens if Tony's friend is bigger than he is?

Tony: Then he goes down and I go up.

Teacher: What happens if a little bitty baby is on the other end?

Students: The baby goes up.

The lesson continued with the children selecting items of various sizes in their efforts to balance the scale. Melissa's use of their prior knowledge of a seesaw enhanced their understanding of the balance scale. The children were excited and eager to participate in the activity. Later, many of the children continued to explore the balance scale as a center activity (See Figure 6).

Children as Risk Takers

Melissa felt that it was her responsibility to provide a classroom environment where children would take risks. This belief revealed itself in the way she encouraged, but

Figure 6. Balancing a scale

never pressured, those students who hesitated before responding to a question. She responded to those students who made a mistake or gave an incorrect answer in a similar manner.

Once, she and the children were playing a game called "magic numbers." The children selected the "magic number" and then they clapped and snapped to indicate which number should be added to one to equal it. For example, they clapped nine times and snapped once for the numeral 10. One student made a mistake while they were clapping and snapping for the numeral 7. The student stopped clapping and looked

down at the floor the moment he realized that he made a mistake. Melissa looked at him with a smile and said, "It's okay to make a mistake." The student continued to play the game.

Teaching Practices

Melissa's practices were categorized into four domains. The domains are: instructional style, instructional methods, instructional and resource materials, and the classroom environment.

Instructional Style

Webster (1984) defines style as a particular or personal manner of doing something. This section describes Melissa's instructional style of teaching (See Table 12).

Administrative Tasks/Classroom Routines and Mathematics

Melissa's practice of incorporating mathematical concepts into most of the activities in the classroom is particularly noteworthy. The integration of mathematics began with the administrative task of taking attendance. Each morning the children counted-off to determine how many students were present. Often, Melissa asked them how many children were absent. She employed the mathematics strategy

Table 12

Domain Analysis of Instructional Style After In-Service

Included Terms	Semantic Relationship	Cover Term
Incorporated math into most administrative tasks and classroom routines		
Gave one direction at a time		
Stimulated children's thinking through questions	are kinds of	instructional styles
Was accessible to students		
Used many math terms		
Gave children choices		

of counting-on to verify which of the suggested answers was correct.

Other times, the attendance was taken while the children counted-off and simultaneously added a Unifix Cube to a "train." Attendance was taken in a similar manner for the whole week. The color of the Unifix Cube that the children attached represented their gender. For example, the girls attached a red cube while the boys attached a white cube. Each day, while displaying the unifix cubes, Melissa asked questions that required the students to compare the present data to previous attendance data

collected during the week. She asked such questions as were more children present yesterday or today and were more girls or boys present yesterday.

Additionally, Melissa related telling time to daily classroom routines such as changing classes, naptime, and going to lunch. She pointed out to the students where the hands of the clock would be during these times. To further increase the students' awareness of the clock, she often asked them to remind her when it was time to change classes, take a nap, or go to lunch. The students took this responsibility seriously and glanced at the clock occasionally as they went about their regular routine.

Giving Directions

Another teaching practice that was representative of Melissa's instructional style was the fact she told the students exactly what to do during lesson presentations. In doing so, she gave them one direction at a time.

For example, before playing "grow and shrink," she gave each child a sheet that had 10 dots on it and a "train" of Unifix Cubes. She familiarized the students with how these items were to be used. First, she told the students to take their "train" apart. She then told them to place one of the cubes on each dot. After telling the students how the game items would be used, she told them to remove the cubes. Melissa continued by telling them to place six cubes on the

sheet. At this point, she introduced the children to the terms "growing" and "shrinking." She continued by telling the students they were going to "shrink" their cubes by taking two away. After completing several examples with the children, Melissa introduced the concept "growing" to them in a similar manner.

During the game, Melissa told the children that "the big boys and girls call 'shrinking' subtraction." She also related "growing" to addition.

Questioning Technique

Melissa's style of teaching can further be described by her use of questions to stimulate the children's thinking and learning. She encouraged the children to verbalize what they discovered while manipulating and exploring the various materials in the classroom during centertime. Usually, the discussions on the children's discoveries were initiated by Melissa. She asked such questions as:

Can you tell me something about _____?

How many shapes did you use altogether?

How many will you have if you put them together?

Will a _____ fit there?

Can you tell me something about the numeral _____?

Did you notice anything else?

How is this one different from that one?

Who has less?

These and similar questions helped the children to describe what they were doing. For example, Tasiana and Missy had just started to make a pattern when Melissa said, "Tell me about your pattern. What colors do you have in your pattern?" The girls responded "Yellow, green, red, and yellow." Melissa asked, "If you were going to continue the pattern, what color would you use next?" Missy replied, "Green." Melissa walked over to another group of children for a few minutes. When she returned, the girls were continuing the pattern. She asked another question that prompted Tasiana and Missy to not only observe the colors that were in their pattern but also to relate these colors to other things that they were familiar with. The question Melissa asked was, "What do these colors remind you of?" Missy said, "Christmas time."

This interaction occurred between Melissa and the girls during centertime. However, she used similar strategies during whole group activities. During a lesson on the concepts more and less, she gave Larry and Jan 10 Unifix Cubes and told them to build a tower. The students sat with their backs to each other. After they built their towers, the following conversation occurred between Melissa and her students.

Melissa: What can you tell me about the towers?

Kendal: They are not the same.

Melissa: How are they different?

Missy: One has more.

Melissa: Who has more?

Kendal: Jan.

Melissa: How many more does she have?

Tony: 1.

Melissa: How many cubes are in Larry's tower?

Eddie: 4.

Melissa: How many did he have altogether?

Jeffrey: 10.

Melissa: Let's put 10 fingers up. Now put 4 fingers down. How many fingers are up?

Cortland: 6.

Melissa: Okay, Larry should have 6 left on his plate. Does he have 6 more?

Students: Yes.

Melissa: How many are in Jan's tower?

Dwayne: 5.

Melissa: How many do you think she has left?

Missy: 5.

Melissa: Why?

Missy: Because 5 + 5 = 10.

Interestingly, the children modeled Melissa's questioning technique when they helped each other with a task. One day, Tasiana did not finish her calendar. She decided to work on it during centertime. She walked over to

me and asked for help. LaToya, who was working nearby, said immediately "We are going to help you." She pointed to the numbers printed in some of the squares on the calendar and told Tasiana to "begin counting." When Tasiana got to 12, the next square was blank. LaToya asked, "What comes next?" LaToya continued asking similar questions until Tasiana finished. Then she told her, "write your name on the bottom, draw a picture at the top, and go show it to Mrs. Jones (Melissa)."

Active Teaching and the Incorporation of Many Math Terms

Melissa's style of teaching can be described as being very "active" because she moved constantly from student to student or group to group and monitored what they were doing. Therefore, she was accessible to the children.

Melissa's use of developmentally appropriate strategies to introduce math terms to kindergartners is especially noteworthy. Terms such as rhombus, trapezoid, hexagon, horizontal and vertical were used frequently in this classroom. Initially, the children were introduced to rhombuses, trapezoids, and hexagons through play. Then, Melissa focused on one attribute at a time to familiarize them with these shapes. The first attribute emphasized was color. After the children learned the various colors of the shapes, she directed their attention to the fact that the shapes had varying numbers of sides.

Many of the children understood the relationship between the number of sides and the names of geometric shapes. One day, while several students were working with shapes, Melissa walked over and held up a hexagon and asked what it was called. One of the four children said, "rhombus." Melissa asked how many sides it had. Daryl counted the sides and said, "Oh, that's a hexagon."

Melissa encouraged the children to look for similarities and differences between the shapes. During one observation, after making a trapezoid on one geoboard and a square on another, she asked the children, "What is special about a square?" She and the children then discussed the differences between a trapezoid and a square.

Often, the children used these terminologies while working individually or in a group during centertime. For example, while completing a puzzle of shapes, Brent looked at an empty space and said, "I need a trapezoid." He reached over and picked up a trapezoid and completed the puzzle.

Many of the children have incorporated these math terminologies into their vocabularies to the extent that they use them frequently during class discussions. On one such occasion, Melissa asked the children how they would make the numeral one on a geoboard. Jeffrey replied, "We would make a vertical line."

Jeffrey's mother, a fifth-grade teacher at Clinton Elementary, was amazed that he recognized a hexagon. One morning, she told the principal, Melissa, and me about an incident that occurred the day before. She, Jeffrey, and her daughter, who was in the sixth grade, were driving home. Jeffrey was sitting in the back seat looking in his sister's math book. He said, "Look at that hexagon." His mother asked, "What did you say, Jeffrey?" Jeffrey replied, "Look, Mom! There is a hexagon in here. It has six sides."

Children Need Choices

Sometimes the children were assigned to their first center activities by Melissa. However, she always told them to switch activities when they were ready. Thus, Melissa's style of teaching can be further described as one that provided choices to students. The choices included the selection of center activities. A variety of activities were available for this purpose. Such activities included playing with puzzles, Unifix Cubes, two-sided chips, number scales, counting money, and reading books. The computer and overhead projector were also used as center activities. The children used patterns blocks to design various shapes on the overhead projector (See Figure 7). Additionally, they made many shapes on the overhead projector using the geoboard.

Figure 7. Making shapes on the overhead projector

Instructional Methods

Melissa's practices reflected the use of a variety of teaching methods (See Table 13). Each of those methods will be discussed in this section.

Hands-On Approach

Melissa's use of the hands-on approach was discussed previously in this chapter in the section of her beliefs. However, this approach was central to her teaching and must

Table 13

Domain Analysis of Instructional Methods After In-Service

Included Terms	Semantic Relationship	Cover Term
Used a hands-on approach		
Used an integrated approach		
Used a problem solving approach	are kinds of	instructional methods
Provided opportunities for individual activities		
Provided opportunities for small-group activities		
Provided opportunities for whole-group activities		

be included in this discussion on the instructional methods utilized by her. Most of lessons incorporated the handling of manipulatives by the children. This strategy enhanced the children's understanding of the concept being presented.

For example, when she introduced the children to the geoboard, she began by having the children handle it. She gave the children a few minutes to pass several around while discussing them. One of the students had seen a geoboard at another school but did not know what it was called.

When the children finished exploring the geoboard, Melissa formally introduced them to it. Her explanations

included such terms as rows, columns, vertical, and horizontal. She also included a previously learned concept in the discussion by asking the children to estimate how many pegs were on the board.

While Melissa talked about the geoboard, many of the children became so excited that they began to applaud. She showed the children how to place a rubberband safely on the geoboard. She then made a trapezoid, hexagon, and a square. The children were able to identify each shape. They knew how many sides each had. They discussed the difference between a trapezoid and a square. Geoboards were placed in a center after the lesson. They were a very popular item with the children (See Figure 8).

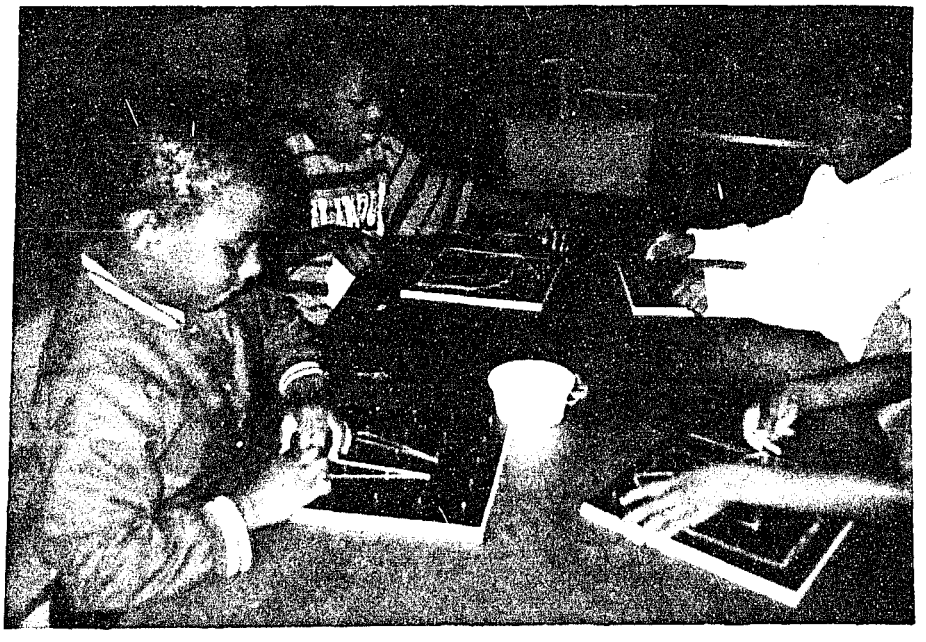

Figure 8. Making shapes on the geoboard

Integrated Approach

An integrated approach was very much in evidence as Melissa taught math and science to two sections of kindergartners. Children's literature was a pertinent component of this approach. Melissa read books with math themes that held the attention of the students. The Teacher Who Could Not Count was one such book. The title of the book amused many of the children. Melissa further heightened their interest by asking them if they could make the digits 1 through 9 with their bodies. Many of the children eagerly demonstrated. They gave suggestions to each other as they tried to make the digits with their bodies.

Melissa suggested that perhaps they could get additional insight on making digits from the story. After reading the story, she asked the students to demonstrate how the children in the story made the digits. Again, the children were eager to participate in the activity (See Figures 9, 10, 11, and 12). The activity concluded with some students writing the digits 1 through 9 on the board.

As she read books to the children, she pointed out or questioned them about the math and science concepts that were included. While reading the book, How Many Snails, she pointed out a page that contained 3 tables with books on each. Three students were selected to make "trains" of

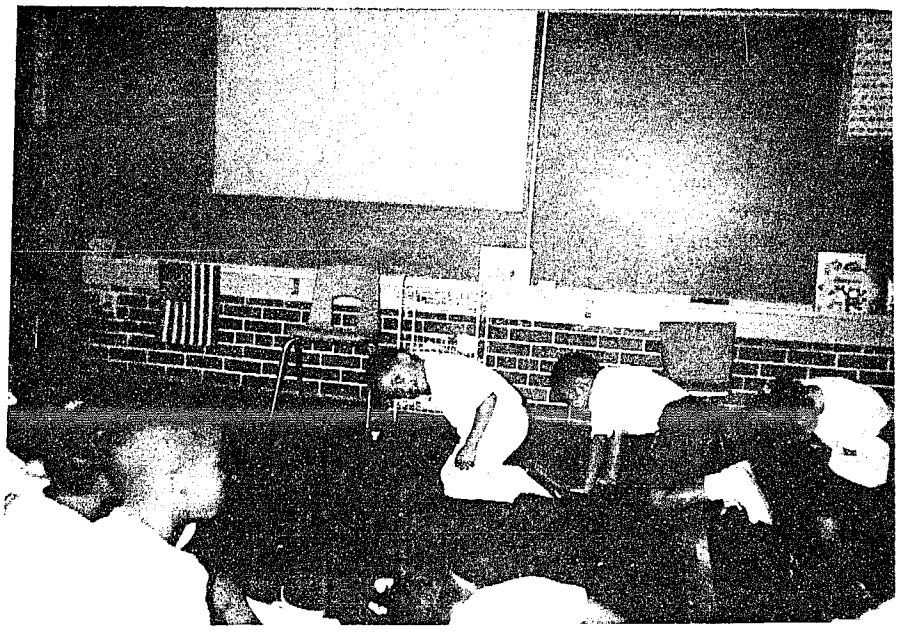

Figure 9. Making the digit 2

Figure 10. Making the digit 3

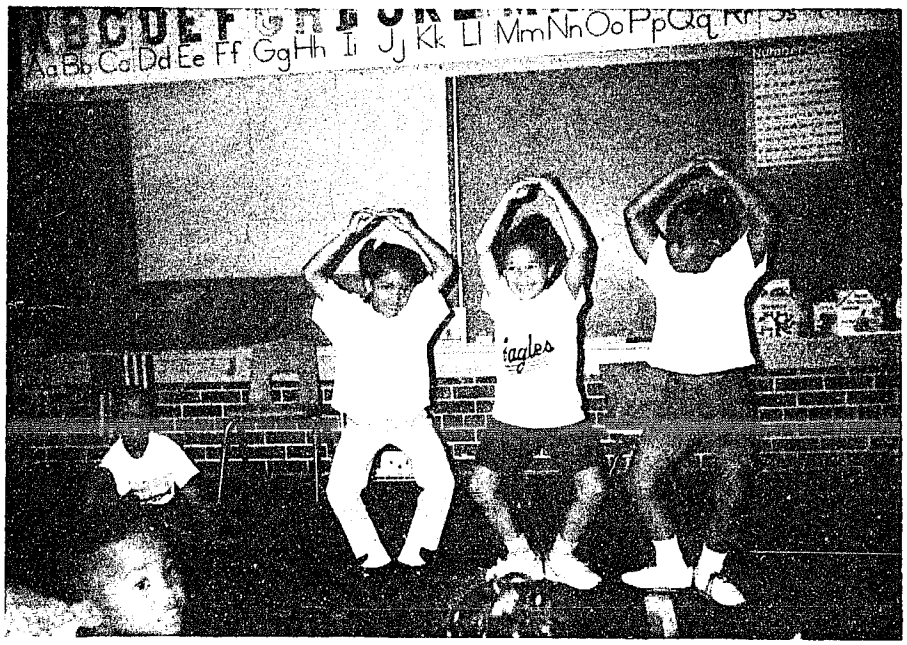

Figure 11. Making the digit 8

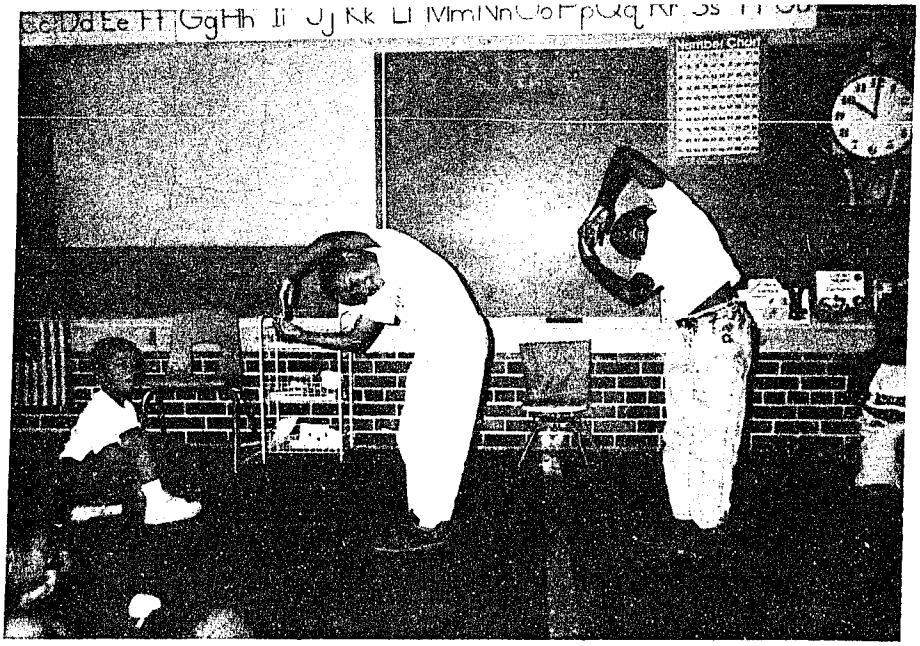

Figure 12. Making the digit 9

Unifix Cubes to represent the number of books on the tables. After the students made the "trains," Melissa let them decide what strategies to use to count the cubes. One student decided to skip-count by 2's. The other two students counted each cube.

One day, she used eggs to present a science lesson on liquids and solids. During the lesson, she explained that eggs are usually purchased by the dozen. She told the children that "dozen is a math word that means 12." Math was further interwoven in the lesson after the students discovered that some eggs would spin while other would not. The children experimented and concluded that an egg that has been cooked will spin.

Other Approaches

A problem-solving approach permeated most of Melissa's lesson. The lesson on eggs that was discussed above concluded with her telling the children that they needed to find out the following day "whether an egg weighs more after it's cooked than it does before it's cooked."

Melissa used individualized, small group, and whole group approaches in her teaching. Opportunities were provided for those children who chose to work alone to pursue their own interest during centertime. For example, Jeffrey sat on the floor alone completing a geometric shapes puzzle. Initially, he talked to himself as he decided which

puzzle to complete. He said, "I know how to do this one, this one, and this one. I'll try this one." After completing the puzzles that he selected, he joined Cortland at the computer.

Frequently, the children collaborated with others. Often, the children's "discussions" related to concepts that had been previously discussed by Melissa during whole-group presentations. For example while "playing school," LaToya was "reading" a book, Ten Little Mice, to Crystal. While looking at a page that had a picture of 9 mice arranged in rows of 3's, LaToya traced the sets of 3's with her finger. She said, "Crystal, you know there are 9 mice on this page because there are 3 in each row. Do you see that?" Crystal looked at the page a few seconds and nodded yes in agreement. This interaction between LaToya and Crystal occurred on April 20th. Interestingly, Melissa read the book, Ten Little Mice, to the children on March 8th and pointed out the picture and told the children to "take a picture of this in your mind, this is a good way to remember that 3 + 3 + 3 = 9."

Another day, during centertime, Jeffrey and Jan were making various designs with bears on the overhead projector. This activity led to a "discussion" on secondary colors when Jeffrey placed a red bear on top of a blue bear and told Jan "see purple." They continued to explore secondary colors by

placing the bears on top of each other and pointing the results out to each other.

Whole group activities were conducted before and after centertime. Activities and materials that would later be placed in the centers were discussed and modeled at this time.

Instructional Resources and Materials

The instructional resources and materials used by Melissa gave additional insight into her teaching practices (See Table 14). Math textbooks were not ordered for kindergartners at Clinton Elementary this year. This curricular decision was initiated by Melissa. She approached the principal and asked her not to order them.

An analysis of her lesson plans showed that she used a number of other resource materials. She gathered ideas from these materials that correlated with the various themes that her lessons reflected. Often, the suggestions and activities that were given in the resource materials served as a catalyst for the creation of new ideas by Melissa. Developing Number Concepts Using Unifix Cubes, Workjob II Number Activities for Early Childhood, Mathematics Their Way, and Box It And Bag It were some of the resource materials used. Additional teaching resources listed in her

Table 14

Domain Analysis of Instructional Resources and Materials After In-Service

Included Terms	Semantic Relationship	Cover Term
Developing Number Concepts Using Unifix Cubes		
Workjob II Number Activities for Early Childhood		
Mathematics Their Way		
Box It And Bag It		
AIMS (Activities that Integrate Math and Science)	are kinds of	instructional resources and materials
Explorations for Early Childhood		
Curriculum and Evaluation Standards for School Mathematics Addenda Series, Grades K-6		
Computer (as center activity)		
Overhead projector (during whole-group discussions and as a center activity)		
Many kinds of manipulatives		

lesson plans were AIMS (Activities that Integrate Math and Science), Explorations for Early Childhood, and Curriculum

and Evaluation Standards For School Mathematics Addenda Series, Grades K-6.

Regarding technology, Melissa had a computer in her classroom. The computer was used as a center activity. The children usually work at the computer in groups of two's (See Figure 13). Melissa had two software programs for the computer, Playroom and KIDSPIX. She expressed a need to know more about appropriate software in order to know what to purchase. Toward that end, she attended a computer workshop at a local university in May. Calculators are available at the school. However, Melissa did not use them.

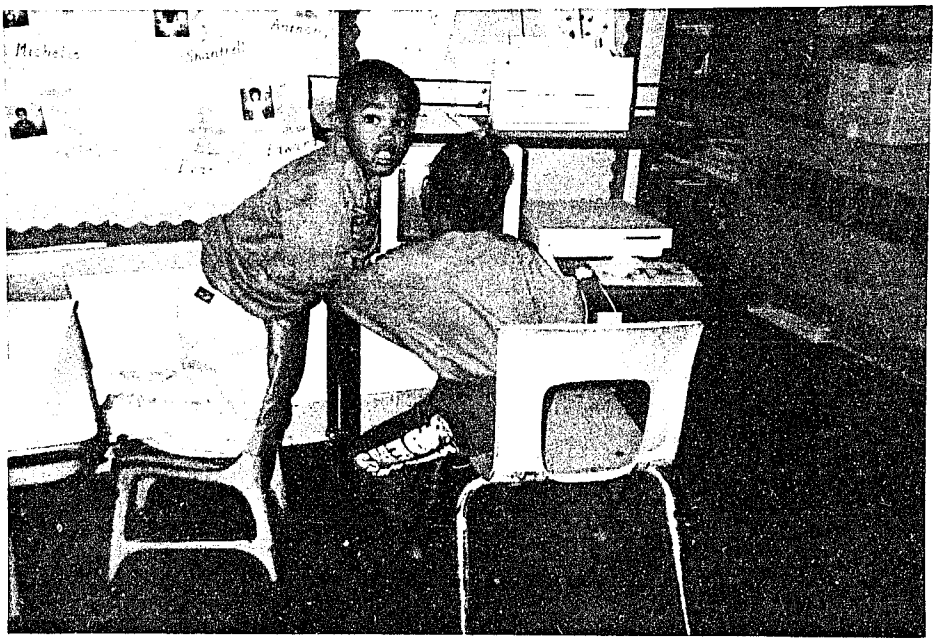

Figure 13. Working on the computer

I asked her, during the interview process, about the lack of activities with the calculator in her lessons. She said:

> There were 20 calculators in the school. They were kept in the library and they were for all of the teachers. They were always checked out by someone. I know I should have made more of an effort to go down and set a date to check them out.

The overhead projector was used by Melissa on a regular basis. Moreover, the children used it as a center activity. During such activities, they modeled many things that Melissa did with the overhead projector. While Melissa mixed tempera paint on the projector when discussing secondary colors, the children used bears. They stacked bears on top of each other to show secondary colors. Often, they used the overhead projector while making shapes on the geoboard. Additionally, they made different designs with shapes.

Melissa had many kinds of manipulatives. She used them often while making whole-group presentations. She also allowed the children to use them. In fact, the children freely explored all of the manipulatives in the classroom. The accessibility of the manipulatives fostered such exploration.

Classroom Environment

Melissa created a classroom environment (See Table 15) that was very relaxed and pleasant. She had a warm

Table 15

Domain Analysis of Classroom Environment After In-Service

Included Terms	Semantic Relationship	Cover Term
Relaxed		
Pleasant		
Warm relationship with students		
Smiled with students		
Praised students	are characteristics of	the classroom environment
Interacted with them a lot		
Accepted children's suggestions		
Gave children plenty of time to respond to questions and complete tasks		

relationship with the students. She was kind to them and wanted them to be kind to each other.

Her voice level never elevated to a range that could be categorized as "yelling," even on those few occasions when the students misbehaved. She handled misbehaving students by using positive guidance techniques to redirect their behavior.

One day, Jeffrey and few other students were making sponge numbers. In a loud voice, he told the other children

to "put the number sponge back" as they attempted to pick up one. Melissa walked over to the table and redirected Jeffrey's behavior by simply saying, "Jeffrey, you need some more paint, don't you?" Jeffrey watched as she added paint to the container and continued making the numbers with the other children without "yelling" at them.

The children were excited sometimes when they engaged in the various activities. Often, they were eager to "show" or "explain" to her what they were doing. Melissa took the time to listen and respond to each child. For example, Solomon, who was using different shapes and designing figures on the overhead projector, ran over to Melissa and asked her in an excited voice to look at what he made. She walked over to the overhead and said, "Everybody look at what Solomon made! I think he did a good job! Solomon, tell me about your picture." Beaming from ear to ear, Solomon responded that he made a house. Melissa asked Solomon to tell her about some of the shapes he used. He replied, "two squares, one trapezoid, one triangle, and one diamond." When asked if he knew another name for a diamond, Solomon said, "rhombus." Melissa praised him by saying he did a good job and "That's what we have been talking about."

Through her interaction with the students, Melissa sent them a powerful message. Her smiles, praise, and conversations conveyed the message that they were important

and they had something to say. Consequently, the children felt important and spoke with confidence.

Often, they gave suggestions during the course of a lesson that related to mathematical concepts. Melissa readily accepted the suggestions. During one observation, the children were skip-counting by standing in pairs. When it was time for LaTonya to stand, Bernard said, "Latonya doesn't have anyone to stand up with Mrs. Jones (Melissa). You could stand with her and we could finish skip-counting to 20." Melissa said, "That's a good idea, Bernard." She stood with LaTonya and the children finished skip-counting to 20.

Some of the children voluntarily did homework assignments. Melissa always gave them time to show and explain what they did (See Figures 14, 15, 16, 17, and 18).

She gave the children plenty of time to respond to questions or complete tasks. One day, she asked the children to give an estimate of how many heads were in the class. The answer was 16 and Jan volunteered to write it on the chalkboard. However, she hesitated and then wrote only a 6. Another student was eager to give the answer. Melissa said, "She knows. We have to give her time to think." Jan smiled and wrote a 1 next to 6.

Melissa recognized that some kindergartners are developmentally ready for some activities, while other are not. When she gave the children writing boards and told

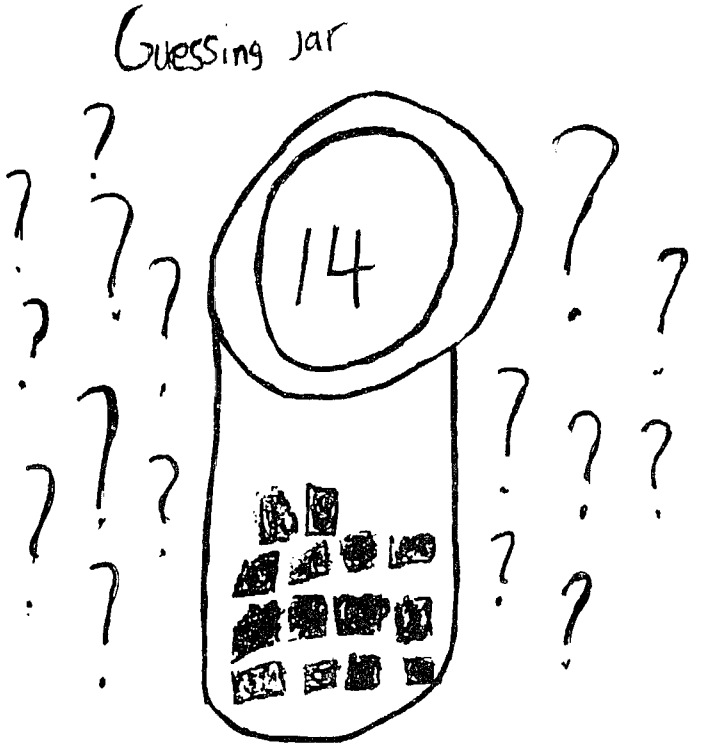

Figure 14. Allee's guessing jar

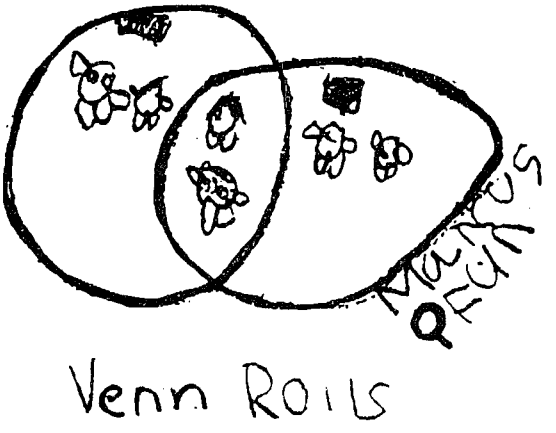

Figure 15. Marcus' venn diagram

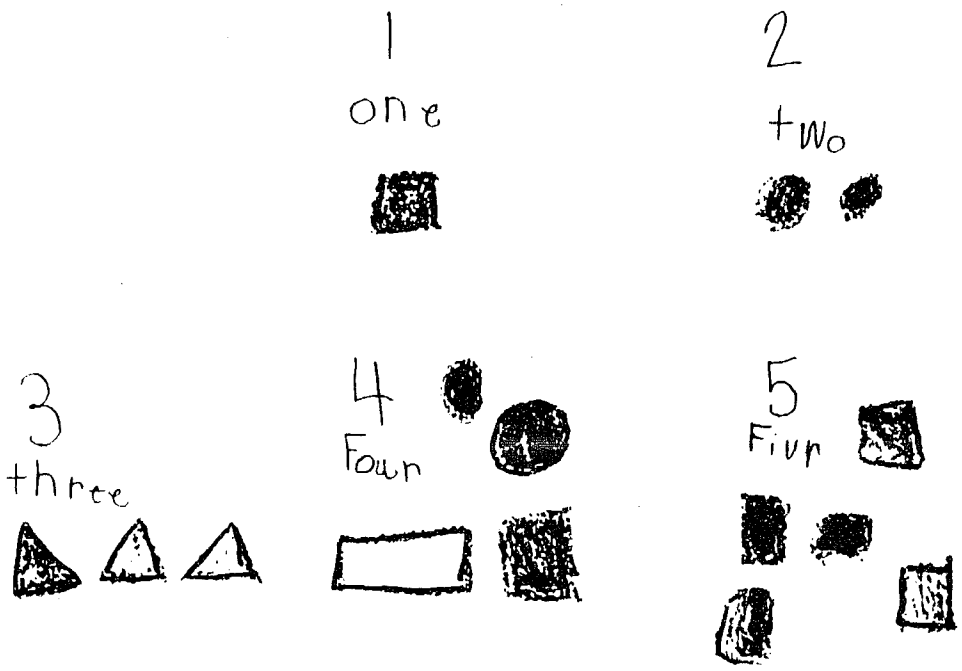

Figure 16. Bernard's representations of digits

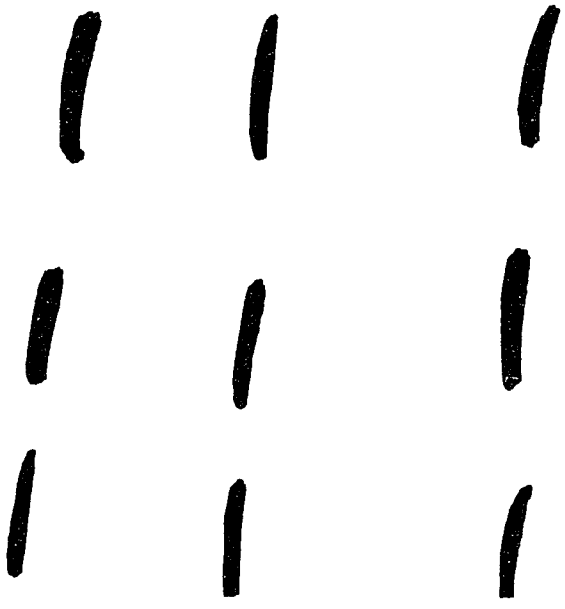

Figure 17. Brandon's picture of 3 + 3 + 3 = 9

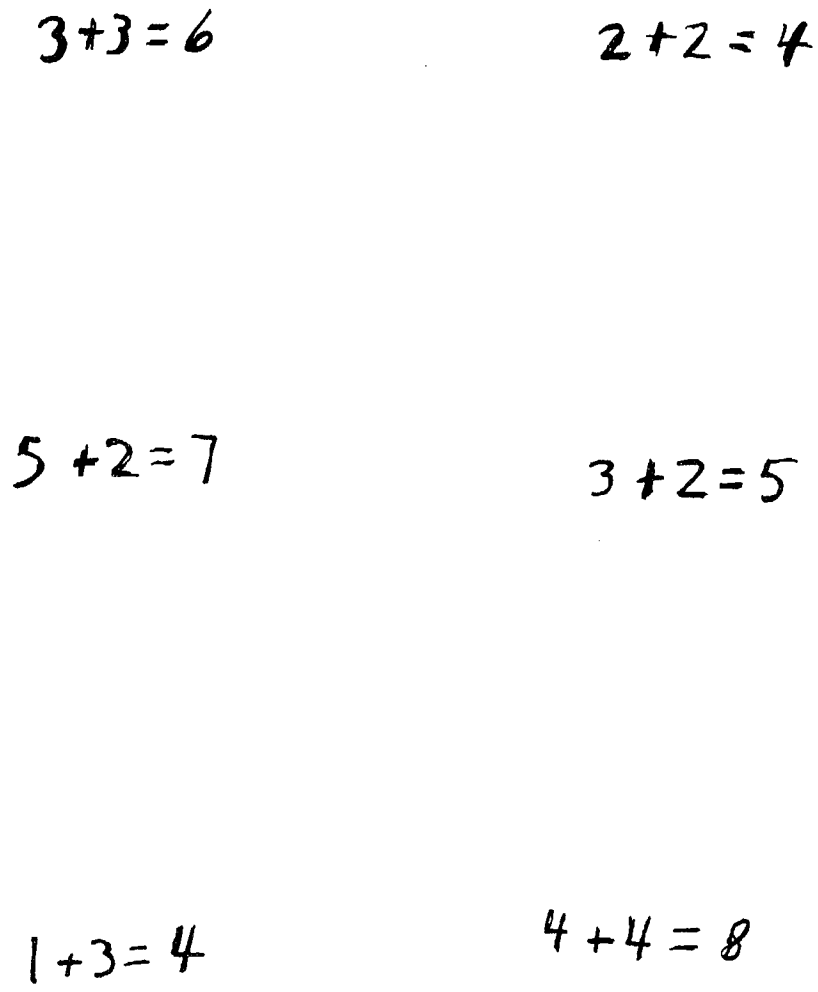

Figure 18. Missy's addition

them to try to write the numerals 1 through 20 from a number chart, some of the students exceeded her expectations and went beyond 60. Other students were less developed in the fine motor area. These students did not complete the task. Ed and LaToja were among the students who did not finish.

Melissa accepted all papers. She did not belittle those students who did not finish. Additionally, she provided activities daily that were geared toward enhancing the fine motor development of Ed, LaToja and the other children. These activities included the manipulation of such items as beads and paper clips. The mathematical concepts, counting and sorting, were incorporated in these activities.

A Taxonomic Summary of Melissa's Beliefs and Practices After the LaSIP In-Service Activities: Observations

This taxonomy (See Table 16) provides a brief summary of the beliefs and practices that have been expounded on in this chapter (Spradley, 1979). As previously stated, these beliefs and practices reflect findings that resulted from observational data.

Melissa's voice will be incorporated more frequently in the remainder of this chapter. Her reflections on some of her past and current teaching practices will be delineated. Analysis of a questionnaire that she completed will be given. The perspectives of other researchers who observed Melissa's teaching during this academic year will be included.

Table 16

Taxonomy of Beliefs and Practices After In-Service Activities: Observations

TEACHING	**BELIEFS**	**How Children Learn**
		They need to explore and manipulate materials (hands-on approach) They need to talk about what they are doing Children should be actively involved in learning
		Role as Teacher
		To set up a classroom that supports individual differences and learning styles of students Facilitator To make learning meaningful to the students To provide a classroom environment where students will take risks
	PRACTICES	**Instructional Style**
		Incorporated math into administrative tasks and classroom routines Gave one direction at a time Stimulated children's thinking through questions Was accessible to students Used many math terms Gave children choices
		Instructional Methods
		Used a hands-on approach Used an integrated approach Used a problem solving approach Provided opportunities for individual activities Provided opportunities for small-group activities Provided opportunities for whole-group activities
		Instructional Resources and Materials
		Developing Number Concepts Using Unifix Cubes Workjobs II Number Activities for Early Childhood Mathematics Their Way Box It and Bag It AIMS (Activities that Integrate Math and Science) Explorations for Early Childhood Curriculum and Evaluation Standards for School Mathematics Addenda Series, Grades K-6 Computer (as center activity) overhead projector (during whole-group discussions and as a center activity) many kinds of manipulatives
		Classroom Environment
		Relaxed Pleasant Warm relationship with children Smiled with students Praised students Interacted with them a lot Accepted children's suggestions Gave children plenty of time to respond to questions and complete tasks

Melissa's Reflections on Past Practices

In June, while going through her files and a closet at school, Melissa found two items that caused her to reflect on her teaching. The items were a shoe box of photographs and a poem. She shared her feelings about the photographs and the poem with me the following day during an interview session.

The photographs were discussed in chapter 4 of this study. Briefly, she had taken photographs of her students over a 5-year period, 1985 through 1990. The photographs showed children engaged in hands-on activities. Looking at those photographs was a very pleasant experience for Melissa. They reminded her that she had been doing many of the things that the LaSIP summer in-service project emphasized. She said, "Yesterday, when I found those pictures, it made me feel good to see students who are now in 6th and 7th grade--they were doing these things in my classroom."

In reference to the poem, Melissa said,

> I was going through my files yesterday and I found this stuff. When my daughter was in kindergarten, she got a good listener award. There was a little poem that the teacher put on the front of an envelope that Crystal brought home.

Crystal is Melissa's daughter. The following poem was on her envelope.

THE GOOD LISTENING HELPERS

We listen
We look and see
We keep hands quiet as can be
We sit still
We do not talk
We may ask question but we do not walk

Author Unknown

After reading the poem to me, Melissa said, "I could not use this in my classroom today. And yet I thought it was wonderful." Interestingly, Crystal was in kindergarten in 1991. Melissa's teaching strategies changed drastically in 1991 and 1992. Moreover, the qualities described in the poem as those of "good listening helpers" were congruent with the expectations that Melissa had of her students during this 2-year period.

A Report From Two Other Researchers

Two other researchers, a professor and a graduate student, observed Melissa four times during the academic year following the LaSIP summer in-service activities. The professor was a faculty member and the graduate student conducted classroom observations of in-service participants. These observations were initially scheduled for October, November, January, and February. Hence, they would have occurred before March when I started collecting data. However, due to a conflict with scheduling, the last

observation was completed on May 3rd. I interviewed the researchers because the items in both instruments used by them (See Appendices A and B) gave additional insight into Melissa's beliefs and practices. These findings will be reported according to the order of the observations.

First Observation

The first observation was conducted in October of 1992 and lasted 3 hours. A revised form of the Checklist for Rating Developmentally Appropriate Practice in Early Childhood Classrooms (Charlesworth et al. 1991; 1993) was used to rate the overall developmental appropriateness of Melissa's classroom (See Appendix A). The items in this instrument are rated on a 5-point scale. Five represents the most appropriate practices end of the continuum, while one represents the least appropriate practices end of the continuum. A rating of 4 indicates that more appropriate than inappropriate practices were observed, while 2 indicates and more inappropriate than appropriate practices were observed.

Six areas are represented in the instrument. They are curriculum goals, teaching strategies, integrated curriculum, guidance of social-emotional development, motivation, and transitions.

Melissa was given a rating of 4.333 in the area of curriculum goals. The researcher indicated that she was providing for the individual needs of all of her students by allowing them to move at their own pace. It was also noted that the children were given an equal amount of positive attention.

The materials and activities that Melissa provided were described as being relevant to the children's lives. There were many learning centers in her room. Most of them focused on math. However, science centers were in evidence also. (Melissa's school is departmentalized. She teaches math and science). It was noted that as the children moved from center to center, they worked well together in groups. Melissa's rating in the area of teaching strategies was a 5.

Very little integration of other curricular areas was observed. Thus, Melissa was given a rating of 1.875 in the area of integrated curriculum.

According to the observer, Melissa exemplified positive guidance techniques. Clear limits were set for the children in a positive manner. When necessary, the children's behavior was redirected. Additionally, Melissa was described as being friendly to the children. The activities she presented fostered student involvement. Hence, Melissa was rated 4.5 in the area of guidance of social-emotional development.

She also received a rating of 4.5 in the area of motivation. Melissa was described as being enthusiastic about her teaching. The researcher stated that the children were in turn enthusiastic about their learning.

Melissa gave the children adequate time to end one activity and prepare to begin another. Thus, she received a rating of 4 in the area of transitions.

Melissa's mean score was 4.034. In reference to developmental appropriateness, this score indicated that more of her classroom practices were found to be more appropriate than inappropriate.

Second Observation

The 2nd, 3rd, and 4th observations lasted about 1 1/2 hours. The researchers used the instrument, A Guide for Observing School Mathematics Programs, to rate Melissa's teaching during each of these observations (See Appendix B). The items in this instrument focused on curriculum and instruction.

The observers coded each item to indicate whether a high, moderate, or low degree of implementation was observed. Additionally, if the item was not observed, it was so indicated. For data analysis purposes, the following digits were assigned to the codes: high (3), moderate (2), low (1) and not observed (0). Each researcher also wrote

detailed explanations of observed examples for each item in the instrument.

Melissa was observed the second time in January, 1992. The researcher reported that Melissa began the lesson with a whole-group activity. The activity was an "attention-getter" in that the children were very observant. Initially, as Melissa hit the xylophone, she and the children counted together. Then, the children were given a "train" of unifix cubes. They took a cube away from their "train" each time Melissa hit the xylophone.

The researcher stated that Melissa told the children exactly what to do by giving one direction at a time. Additionally, she was very positive and pleasant. When the children engaged in center activities, Melissa circulated and talked to them about what they were doing.

Overall, the researcher felt that Melissa incorporated problem-solving strategies in her lesson that were meaningful to the children. However, it was noted that estimation was not used by her as often as other strategies such as patterning and counting.

Melissa communicated mathematical information through speaking, writing, and demonstrating at a level that was appropriate for the children. However, the use of graphing as a means of communicating mathematical ideas was not observed by the researcher.

Melissa's classroom environment encouraged interaction between the students and their peers and the students and the teacher. The arrangement of the furniture in the classroom fostered such interaction. There was room for the children to work in large or small groups or on individual tasks.

There was no evidence that the children were using calculators. Moreover, none of the children used the computer during this observation. Melissa received an overall rating of 2.56 which placed her close to the high level of implementation category.

Third Observation

Melissa was observed again in February. During the lesson, she asked the children to estimate how many Unifix Cubes were in a jar. After the children gave their estimates, they counted the cubes. The lesson continued by providing a connection between the concrete and pictorial conceptual levels of the children. This connection was forged when the children drew their own jar and represented the number of Unifix Cubes they counted by drawing them inside the jar.

According to the researcher, Melissa gave the children clear directions. Moreover, she had the children's

attention and they responded well to her. She did not have to stop often to redirect the children's attention.

Melissa monitored what the children were doing during centertime. Often, she sat and talked to them. She questioned the children trying to elicit from them what they were doing. These questions often extended the children's understanding of the concept. The researcher also indicated that, in addition to being accessible to the children, Melissa always got down on their level to interact with them.

As the other researcher had indicated during the previous observation, mathematical ideas continued to not be communicated through graphs. Similarly, calculator and computer usage by the children were not in evidence either. Melissa was given a rating of 2.62 this time. Again, this rating was in the high level of implementation category.

Fourth Observation

The fourth observation was completed on May 3, 1993. I was present during this observation. Both Melissa's and my views about this lesson will be given in the next section of the study. The researcher stated that the children were very restless during this lesson. The lesson began with Melissa asking the children to count off for attendance purposes. Many of the children were not listening and did

not know when it was their turn. Melissa stopped the activity and told them that she would give them time to finish talking. She attempted to complete the activity several times before the attendance was taken.

Melissa attempted two other activities and had similar problems trying to get the children's attention. One of the activities involved the calendar, while the other was a game involving two-sided chips. The children were to spill the chips from a cup and show the results with their fingers. They used their right hand to indicate how many red chips fell out and their left hand to signify how many yellow chips fell out.

Many of the children misbehaved continually during the lesson. In fact, Melissa sent two of them to time-out. The researcher explained that she could tell that Melissa was upset with the children. However, she handled their misbehavior in a proper manner in that she tried to redirect it. The guidance technique of redirection did not work.

The researcher stated that Melissa continued with group activities much longer than she had during the previous observation. In fact, she stated:

> Melissa's lesson extended to about 40 minutes. I think part of that had to do with the fact that I was there. She knew that I was there to observe her and she wanted to make sure that she covered her objectives. The lesson should have been cut off after 10 minutes because the children were so restless. They were restless when they entered the class. I don't think she could have done anything else to calm them down other then sending them to centers.

In terms of mathematics, Melissa employed a variety of strategies in her lesson. Patterns, estimation and having the children make predictions were some of the strategies used. The students used the computer during centertime. However, there was no evidence of calculator usage.

Melissa's mean score had increased from 2.56 on the 1st observation to 2.62 on the 2nd observation. However, due to the difficulties that she experienced during this observation, it decreased to 2.03. Thus, the rating she received was in the moderate level of implementation.

An Analysis of Melissa's and the Researcher's Diaries

I asked Melissa to keep a diary. She was told to include entries on the difficulties as well as the successes she experienced in her classroom. I kept a dairy of similar events also. Additionally, I recorded all personal accounts that Melissa gave about her life during the observational period.

Melissa and I agreed that the lesson that she presented on May 3rd (the last lesson discussed in the previous section) was her least successful one. May 3rd was the Monday following the administration of the California Achievement Test. Melissa presented the same lesson to both of her mathematics classes. The students in the first class were attentive and eagerly participated in the activities.

The second class began with Melissa telling the students many times to "push back" or "sit down." She and the students were sitting on the floor in a circle. Melissa asked the children to count off for attendance purposes. However, many of the students were talking instead of listening and did not respond when it was their turn. Finally, Melissa stopped the activity and announced that she would wait until they were finished. After the children settled down, she asked each of them to count off again. This time they were given a Unifix Cube to make a "class train." The girls and boys were given different color cubes.

Melissa separated the Unifix Cubes and made a "train" for the girls and a "train" for the boys. She asked the children if they could tell her something about the two "trains." Many of the students were talking again. Melissa stopped the activity and said, "I'm going to do something that I never do--write some names on the board." The children settled down again and the discussion on the attendance "trains" continued.

A new student joined this class last week. Melissa's questions and the visual representation of attendance, the "trains," led the children to the realization that there were an equal number of boys and girls in the class. However, there was now one more boy than girls in the class.

After the activity ended, Melissa told the children to stand up and wiggle their toes and fingers. It had taken Melissa 10 minutes longer to complete the attendance activity in this class than it had in the previous class. She then introduced the next activity by relating it to the California Achievement Test that was administered to the children a week earlier. She reminded the children that there was an item on the test about a calendar. She showed them a calendar and told them the month of May started on Saturday. Language arts was integrated in the activity through spelling and the children's prior knowledge of capitalization. After spelling "May," several students were asked if they begin their name with a capital or a lower-case letter. She then related the analogy that May and a person's name are "special" to the children because both begin with capital letters.

The discussion on the calendar continued with Melissa explaining rows and columns to the children. She placed a butterfly on each day in May. The butterflies were of varying colors. Estimation and patterns were incorporated into the lesson. The children estimated how many days were in May. The activity concluded after they studied the butterflies to discover a pattern.

Melissa took the previous class outside to play for 10 minutes at this juncture in the lesson. However, she went directly into a third activity with this class. The third

activity involved the children spilling two-sided chips from a cup and using their fingers to show the results. Many of the children were restless and talkative as they had been throughout the lesson.

Then, the children participated in center activities. However, centertime lasted for a considerable shorter period of time than usual today because the whole-group activities had continued for more than 40 minutes.

Many of the teaching strategies that were in evidence in Melissa's previous lessons were present in this one. Such strategies included her incorporating mathematics and administrative tasks, such as attendance, asking questions to help students construct knowledge, and relating new concepts to previously learned knowledge. A major difference in these whole-group activities and previous ones was that they were much longer.

The entry that Melissa wrote in her diary that evening showed that she was perplexed about the lesson. She wrote:

> Today, I used the same strategies with my second group that I had used with the previous class. However, the children who had always done so well during whole-group time were restless. I couldn't believe that these were the same children that I had all year. I had never had behavior problems with them before. I could not draw them into the lesson. I lost them! Some of the same things we had done many times before just did not work.

She continued to reflect on the lesson. Interestingly, in the previous diary entry she was quite bewildered as she focused on her failure to "draw the children into the lesson." The following day in another diary entry, she

began to ponder what she could have done differently to make the lesson successful. She wrote:

> I was very upset yesterday about my lesson with my second group of students. I've been thinking about what I could have done differently. I know I kept them sitting for the group activities too long. I probably should have taken them out for a short break on the playground and then let them select center activities.

The fact that the usual routine of the children was disrupted by the administration of the standardized test is noteworthy. They did not come to Melissa's class at all during the previous week, the testing period. Instead, they spent the entire day with Mrs. Brown. Mrs. Brown was the other kindergarten teacher with whom Melissa was paired. Their routine was further disrupted on the following Monday, the day of this lesson, because Mrs. Brown was absent. Moreover, the children were aware that she would be absent all week.

It is equally noteworthy that Mrs. Brown was extremely strict with the children. I had an opportunity to observe her earlier in the year. Her voice tone was very harsh. I vividly recall an incident that occurred in her class on the day of my observation. After assigning three students to a center, she told them to trace a triangle. One student decided that he wanted to draw a triangle instead. Mrs. Brown walked over to the child and snatched his paper out of his hand and crumbled it and threw it in the trash can. She told the child, "I'm the teacher in here and you are to do as I say." The child was then placed in time-out.

Mrs. Brown's absence and the disruption of the children's routine during the week of the standardized testing were extenuating circumstances that impacted the outcome of the lesson. After reflecting on the lesson, Melissa questioned her inability "to capture the attention of the children." In her diary entry, she wrote, "Although I was shocked by the children's behavior. I didn't handle the situation properly. I should have done a better job of settling them down before starting the lesson."

Regarding teaching successes, Melissa and I agreed that her most successful lesson was presented on May 24th. Upon returning from the water fountain, she and the students assembled on the floor in a circle. She called Karen up front and asked the children, "What do you notice about her clothes?" Daryl said that he saw a clock. A brief discussion followed between Melissa and the children on the hour and minute hands. Jan said that she saw numerals and named them as Melissa pointed to them. Then, Melissa told the children, "When I saw Kimberly this morning, I saw lots of math things that we have talked about this year."

LoTaja was called up front and the children said, "There are circles on her dress." Melissa told them to look closely at the circles. Evan responded "the circles are pink and green." Melissa asked, "So, do they repeat themselves?" The children replied, "Yes, they make a pattern."

The lesson continued with the children pointing mathematical concepts on the clothing of their peers. Daryl had on his Chicago Bulls's outfit. The children pointed out the numeral 23 on his shirt. Then, Jeffrey announced, "Scottie Pippen plays for the Bulls too, but I don't know his number."

The children noticed that Jeffrey was wearing a blue and white striped shirt and told Melissa, "The stripes repeat to make a pattern." They noticed that Dwayne was wearing a shirt with small and large stripes and LaToya was wearing a white shirt, black pants, white socks, and black sneakers.

As the lesson continued, the children were able to find something mathematical on all of their peers. Then, Melissa gave each of them a sheet of paper and they drew themselves showing the mathematical concept that was discussed. The lesson culminated with some of the children writing a story about their picture (See Figures 19, 20, and 21). Others dictated their stories to Melissa. Some of the children who dictated their stories copied them later on their sheets.

As Melissa had successfully made the mathematics/literature connection in her previous lessons, she succeeded in making the mathematics/writing connection in this lesson. This was Melissa's first lesson in which she enhanced the children's understanding of mathematics

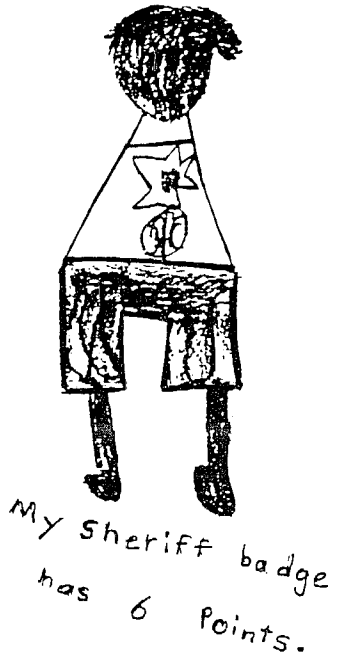

Figure 19. Daryl's story

Figure 20. Cortland's story

through their writing. Moreover, a connection was made between mathematics in the children's world (their clothing) and writing.

Figure 21. Jeffrey's story

The following excerpt came from Melissa's diary. It contains many of her thoughts about the lessons. Her apprehensions about incorporating writing and mathematics are also included.

> This morning while the children were getting water, I looked down the row at them and one little girl had on a dress that had numbers all over it. I thought, "It's her dress, it's part of her world." Then, I began to look closely at the clothing of the other children. When I call the little girl up that had the dress on with the numbers all over it, the children immediately identified the number concepts. They were able to find a number concept on everyone and they were excited. Then, I gave the children a sheet of paper and told them to draw themselves and write a story. They did an excellent job! We felt good about what we were doing. They were happy with what they were doing and I was happy. It turned out to be a pleasant morning and a successful one! I was introduced to writing and math last summer in LaSIP. That is not to isolate numbers or concepts but to make them a part of the real world of the child. As dialogue between the students and their peers and the students and me fosters understanding in a math class, so does their writing about math experiences. I had hesitated about incorporating writing and math because I was not sure how to pull the lesson together. This was the first lesson in which I pulled it together and it worked well. I don't know if I would have noticed the math concepts on the children's clothing last year. Since LaSIP, I've just begun to think math.

Additional Examples of Thinking Mathematically

Melissa said that as a result of participating in the LaSIP in-service activities, she was now "thinking more in terms of math." She continued by saying, "I open a book and I think math. I am more aware of finding mathematics that relates to the world of children."

During the interview process, she showed me some sea creatures that she purchased from Walmart. She explained:

> There is a book called <u>Sea Squares</u>. I do a unit on it. In the book, there are pictures of sea horses, starfish, and other sea creatures. I was in WalMart the other day and I saw these packs of sea creatures.

I bought them to incorporate more math into the unit. I'm going to use them for counting.

Melissa was tutoring Tony, one of her students (during the summer that the interviews were conducted). One day, she took Tony and her daughter, Crystal, to the library. The following day when I arrived, she was very excited about a book, Jack and the Beanstalk, that she found. She read the following excerpt to me: "So the Ogre sat down to a breakfast of five meat pies, three roast turkeys, ten pounds of fried potatoes, eight dozen eggs, and a few gallons of hot chocolate." Then, she said, "I've got to have this book. I could teach so many lessons on the numbers in this sentence. I could teach counting, measurement, etc."

Analysis of Questionnaire

Melissa completed the Teacher Questionnaire (Charlesworth et al. 1991; 1993) (See Appendix C) again in June of 1993. This was one year after she first completed it during the LaSIP summer in-service activities of 1992. The responses that she gave in 1992 were discussed in chapter 4. Briefly, the responses she selected on the questionnaire were not congruent with the oral accounts given by her principal and herself regarding her practices prior to the LaSIP summer in-service activities. Additionally, there were many discrepancies between her

lesson plans and the responses she gave on the questionnaire.

The Teacher Questionnaire (Charlesworth et al. 1991; 1993) (See Appendix C) contains two subscales, a Teacher Beliefs Scale and an Instructional Activities Scale. Developmentally appropriate and developmentally inappropriate items are included in both scales. The statements in the Teacher Beliefs Scale are rated on a Likert scale with 1 representing "Not Important At All" and 5 representing "Extremely Important." For comparison purposes, the mean score from the first administration is placed in parenthesis next to the mean score from the second administration. Melissa's mean score on the developmentally inappropriate beliefs items was 1.692 (1.923). This score means that she categorized the stated developmentally inappropriate beliefs as "not very important."

The need for teachers to provide opportunities for students to interact socially with their peers and to ask questions and give suggestions were some of the developmentally appropriate beliefs items included. Melissa's mean score on these and similar items was 5.0 (4.923). This rating showed that she felt that it was "extremely important" that such strategies occur.

The items in the Instructional Activities Scale of the questionnaire are rated from 1 to 5. One represents "Almost Never," while 5 represents "Often."

With a mean score of 1.846 (2.077), Melissa indicated that her students "rarely" engaged in inappropriate activities. Such inappropriate practices items as children being ability-grouped for tasks were included.

Examples of developmentally appropriate practices were the need for children to play with manipulatives and games. Melissa rated the items as occurring "often" in her class. Her mean score was 4.786 (4.357).

Summary

The LaSIP in-service activities focused on improving the participants' mathematical knowledge and developing a better understanding of K-3 mathematics practices from a child development perspective. The objectives of the workshop included the promotion of use of the Standards (NCTM, 1989, 1991) in teaching, discussions of mathematical strategies among students and between students and the teacher, the teaching of mathematics in context, and the advancement of developmentally appropriate practices.

Melissa's beliefs were organized into two categories. One category described her views on how children learn, while the other category identified her beliefs about her role as teacher. In reference to Melissa's beliefs about how children learn, she believed that children learn by exploring and manipulating materials (hands-on approach), by

talking about their discoveries, and by taking an active rather than a passive role during lesson presentations.

Melissa believed that "as a teacher," she was responsible for setting up a classroom that supported the individual needs of all of her students, while employing teaching strategies that made learning meaningful. She also viewed her role as teacher as that of facilitating student learning and encouraging them to take risks.

Melissa's "style of teaching" reflected many qualities. Some of these qualities included her incorporation of mathematics into many of the administrative tasks and classroom routines and her questioning technique. She stimulated the children's thinking through questions. Additionally, she used developmentally appropriate strategies to introduce the kindergartners to many math terms.

She employed a variety of methods in her teaching. However, the hands-on and problem-solving approaches permeated all of her practices. Children's literature served as an impetus for much of the integration that occurred with other curricular areas.

Her math lessons resulted from many different instructional resources. She gathered ideas from the resources that correlated with the various themes of her lessons. A variety of math manipulatives was available. All of these materials were available for use by the

children. Regarding technology and audio-visual materials, the computer was used as a center activity. However, although some calculators were available in the school, they were not used. The overhead projector was used by Melissa during lesson presentations and by the children as a center activity.

The classroom was very pleasant. There was a lot of student/student and student/teacher interaction. The children eagerly gave suggestions or explanations during lesson presentations.

During the course of the observational and interview stages of this study, Melissa reflected on past practices. While reflecting, she viewed some of those practices through different lens then she had previously. Reflecting on current practices occurred through diary entries.

Melissa was observed by two other researchers four times during this academic year. During the first observation, the overall appropriateness of her classroom was rated to be on the appropriate end of the continuum (See Appendix A). Her teaching of mathematics was the focus of the other three observations (See Appendix B). She received one moderate and two high ratings.

Melissa completed the Teacher Questionnaire (Charlesworth et al. 1991; 1993) (See Appendix C). The

responses that she indicated as being representative of her beliefs and practices were congruent with the findings of the observational data.

CHAPTER 6

SUMMARY, CONCLUSIONS, DISCUSSION, AND IMPLICATIONS

The purpose of this study was to investigate the beliefs and teaching practices of a selected kindergarten teacher who participated in the LaSIP summer mathematics in-service activities. This study focused on the teacher's beliefs and classroom practices both prior to and after the in-service activities. Ethnographic and life history methods were employed to answer the following questions.

1. What were the beliefs and teaching practices of the kindergarten mathematics specialist prior to participating in the in-service activities?
2. Did the beliefs and practices of the kindergarten mathematics specialist change after participating in the in-service activities?

This chapter begins with a summary of the results that were reported in chapters 4 and 5. Conclusions drawn from these results are then presented. The discussion that follows places the conclusions reached in perspective relative to previous research on the effects of teacher in-service activities. Implications for directors of in-service activities and researchers are suggested. Finally, recommendations for future research are enumerated.

Summary

The first research question was answered through life history data which revealed that many experiences impacted Melissa's beliefs and practices prior to her participation in the LaSIP summer in-service activities. Some of the experiences occurred in the academic realm (primary, secondary, and pre- and in-service education), while others occurred in her personal life.

In reference to in-service education, Melissa attended a number of math workshops prior to participating in the LaSIP activities. Often, she accepted the suggestions that were proposed in the workshops and added them to her repertoire of teaching practices. Proposed suggestions that conflicted with her beliefs were rejected or altered. She rejected proposals that: (a) did not allow for "flexibility in teaching" but instead provided "a cookbook approach," or (b) did not "fit the way children learn." In those instances, when the school system adopted programs that conflicted with her beliefs, she "altered them to fit her teaching and her students."

The results of this study revealed two distinct periods in Melissa's teaching prior to her participation in the LaSIP summer workshop. Melissa's self reports were the primary data source for these periods, with triangulation provided through an interview with her principal and

analysis of her lesson plans, photographs, and written statements. In 1985-90, Melissa's teaching reflected many of the ideas that were emphasized in the LaSIP workshop. Specifically, her pedagogical strategies reflected: (a) a knowledge of child development, (b) a commitment to enhance the children's language development, and (c) an effort to encourage student/student interaction.

Melissa's use of developmentally appropriate practices reflected her knowledge of child development. Such practices included activities that allowed the children to engage in meaningful actions (through play) that sparked their interests, curiosity, and thinking. The activities were usually of a hands-on variety. For example, the children measured different items in the classroom with straws of varying lengths. Then, they compared their answers. The activity culminated with the children recording the results in a "measurement book."

Many of the lessons consisted of activities that allowed for progression in the understanding levels of young children in an appropriate manner (concrete to pictorial). Additionally, Melissa's lessons reflected the integration of concepts/subjects. She used themes such as zoo animals, shapes, and families to integrate the different curricular areas. This strategy allowed the children to make connections between the disciplines.

In terms of a commitment to language development, Melissa's teaching strategies emphasized two goals. They were: (a) to enhance the children's "language development, and (b) to increase their involvement in the lessons through "sharing their ideas." The daily schedule and the organization of the classroom augmented the accomplishment of these goals. The children were encouraged to "interact with and discuss their activities" with each other during centertime. The furniture arrangement encouraged further "interaction and discussion." Students' desks were pulled together to facilitate group activities.

In 1991 and 1992, Melissa's teaching practices changed. An initial change in her practices was related to friction that existed in her school life. A school/personal life linkage was identified when her teaching practices declined further during a period of personal problems. Melissa described her school life during this period as being "overwhelming." Her school practices were "very structured." Hands-on activities were no longer the focus of her teaching. Instead, emphasis was placed on practicing math in the abstract by completing worksheets and workbook pages.

Melissa's practices were not the only aspect of her teaching that changed. The overall environment of the classroom changed also. She stated that she "yelled"

frequently at the students and limited their "interaction with each other."

Data pertaining to Melissa's beliefs revealed that her views about the importance of providing opportunities for young children to express themselves have been a part of her belief system throughout her teaching. Her views about the need for children to manipulate and handle materials (hands-on) have also been a germane and a permanent part of her belief system. Melissa said that these beliefs, and others that she holds, did not change during the period of personal problems when her teaching practices changed. In fact, she said that she "suppressed" them. In statements, that were written during this period, Melissa referred to the "suppressed" beliefs that were reflected in her teaching practices of 1985 through 1990.

The second research question was answered through observational data. These data were collected during the academic year following the LaSIP summer workshop. Analysis of the data revealed that Melissa's teaching practices were similar to what they were in 1985 through 1990. A typical lesson consisted of a whole-group presentation, followed by center experiences. Much emphasis was placed on discussions and hands-on activities during whole-group presentations. Questions were used as a tool to extend the children's understanding and as a motivational technique to encourage them to verbalize their observations and discoveries of

various mathematical concepts. Similar questions were asked as the children participated in a variety of activities during centertime. Frequent student/student and student/teacher interaction occurred during this time.

Additionally, the data documented a change in teaching practice that appeared to be an effect resulting from the LaSIP in-service. Melissa's current practices reflected a much greater problem-solving emphasis than was evident in the 1985-90 period. Problem-solving is, of course, a major feature of current mathematics reform (NCTM, 1989, 1991).

Melissa gave the LaSIP workshop credit for "bringing those beliefs and practices back" that were once a part of her teaching. She said:

> The LaSIP workshop awakened something in me that I knew was there. And, I was introduced to new ideas which caused my beliefs to evolve further. It made me stop and think about what I used to do and what I was presently doing. Through reflecting on my beliefs and practices, I decided that I needed to get back to hands-on activities, the centers, and providing different ways to learn the same thing depending on the learning styles of the children. If there is a correlation between "dittos" and developmentally inappropriate teaching practices, I have changed. I can now say that I was given two boxes of paper this year and most of it is still in my closet. I'm now using paper mostly for their (children) drawings and journals.

The LaSIP experience served as a catalyst for Melissa's reflections. Change (a return to developmentally appropriate practices) resulted from her thinking about the conflicts that existed between her beliefs and her actions (Kelly, 1955; Piaget, 1970). Melissa stated, "I knew that I

was not doing the job that I was supposed to do. However, the LaSIP experience brought my awareness of what I doing to another level." Melissa continued to reflect on her beliefs and practices during the gathering of this data. She questioned past practices often. For example, while discussing the past practice of presenting chapters in consecutive order, she said, "I don't know where I got the concept that after teaching a chapter you don't teach the skills in that chapter again. I can't believe I did that."

Conclusions

The following conclusions were drawn from this study:

1. Melissa rejected suggested proposals that:
   (a) did not allow for flexibility in teaching, or
   (b) conflicted with her beliefs about how children learn.
2. When the school system adopted programs that were inconsistent with Melissa's beliefs, she tailored them to fit her teaching and her students.
3. Melissa's personal life is intertwined with her school life.
4. Melissa "suppressed" her beliefs about teaching during a period of turmoil in her personal life.
5. The LaSIP summer in-service activities served as a tool for Melissa's reflections.

6. Through reflection, Melissa revived developmentally appropriate beliefs and practices that were in evidence during an earlier period.
7. Melissa's increased emphasis on problem-solving resulted in her revived practices (that already mirrored many of the LaSIP objectives) making even more progress in that direction.

Discussion

Concern for students is the primary motivator for teacher change (Cobb, Wood, Yackel, 1990; Guskey, 1986; McLaughlin, 1991; Mitchell, Ortiz, Mitchell, 1987). In fact, researchers (Richardson, 1990, 1991, 1994; Tobin, 1987) indicated that teachers will not incorporate recommendations that conflict with their perceptions of how children learn. Doyle and Ponder (1977) found that teachers analyzed proposals to determine if they were "practical" in terms of how they relate to their beliefs about student learning. Similar to Tobin (1987), Richardson (1990, 1991, 1994), and Doyle and Ponder (1977), this study found that Melissa rejected proposed suggestions that conflicted with her beliefs about how children learn.

This study adds another dimension to the reasons teachers give for rejecting suggestions. Melissa rejected proposals that did not allow for flexibility in teaching.

She felt that proposed programs restricted her pedagogical methods when she had to adhere strictly to predetermined guidelines and could not make changes.

Richardson (1990, 1991, 1994) suggested that teachers often alter new proposals. This study found that Melissa altered new proposals also. However, Richardson reported cases of teachers changing self-initiated strategies that conflicted with their beliefs. These self-initiated changes included strategies such as trying a new activity. According to Richardson (1990, 1991, 1994) once these strategies are implemented, the teachers evaluated them to determine if they are consistent with their beliefs. Those that are found to be inconsistent were often altered. In this study, Melissa altered those programs (adopted by her school system) that were incompatible with her beliefs about teaching and how students learn. Melissa stated, "Some programs assumed that all children are the same. They failed to realize that things don't work the same in all instances. You have to make adjustments when necessary for your students."

Some researchers (Beynon, 1985; Goodson, 1992) have suggested that teachers' school lives are interwoven with their personal lives. However, there seems to be little documentation that confirms the linkage between teachers' personal and professional lives. This investigation extends the body of knowledge in this area. It explicates in great

detail the impact that Melissa's personal life has on her school life.

No study was found that directly supports the finding pertaining to Melissa "suppressing" her beliefs during a period of personal problems. However, many researchers (Charlesworth et al. 1993; Duffy, 1977; Nisbett & Ross, 1980) have documented discrepancies between teachers' beliefs and their practices, as was evident in Melissa's case. Nisbett and Ross (1980) concluded that often beliefs persist even though they are not accurate representations of reality. In fact, Charlesworth et al. (1993) found that there are often inconsistencies between teachers' professed beliefs and their observed practices. Duffy (1977) also concluded that teachers often employ practices that do not reflect their expressed beliefs.

Schon (1983) indicated that when teachers begin to reflect-on-action, they begin to question the customs of the educational system on a broad scale and to challenge their own teaching. Shaw, Davis, Sidani-Tabbas, and McCarthy (1990) stated that reflection throughout the change process is necessary. Similar to Schon (1983), Shaw et al. (1990) found that teachers began to question their practices while reflecting. Hunsaker and Johnson (1992) concluded that reflection was a determining factor in the change process of a third-grade teacher.

The finding of this study, regarding reflection, parallels the findings of Schon (1983) and Shaw et al. (1990). The in-service activities sparked Melissa's reflections. Reflecting was followed by questions about the practices that she exhibited in 1991 and 1992. This study, like Hunsaker and Johnson (1992), concluded that the reflection process served as an impetus for Melissa's return to developmentally appropriate practice.

Flexer, Cumbo, Borko, Mayfield, and Marion (1994) reported on third-grade teachers who participated in an in-service effort that introduced performance assessments in the hopes of improving both instruction and assessment in mathematics. The NCTM Standards (1989, 1991) were emphasized. One of the participant's practices reflected the Standards when she entered the workshop. This teacher's practices mirrored the Standards even more at the completion of the workshop.

Melissa differs from the teacher in the Flexer et al. (1994) study in that she entered the LaSIP workshop with "suppressed" beliefs and with practices that can best be categorized as developmentally inappropriate. This investigation found that she revived developmentally appropriate beliefs and practices that were in evidence during an earlier period (1985-90). Many of her teaching practices during the 1985-90 period reflected the objectives of the LaSIP workshop. This study documented a change in

Melissa's revived practices in the area of problem-solving; while Flexer et al. (1994) found the teacher's overall practices changed.

Implications

The findings of this study have implications for directors of in-service activities and researchers. The findings highlight the need to remind directors of in-service activities that teaching is an art as well as a science. In fact, teachers may be viewed as craftsmen who are learning on the job. Thus, each teacher "remakes" the classroom in accordance with his or her own imagination, inspirations, and learning. In-service activities must, then, allow for the flourishing of the individual artistry of a teacher (Lieberman & Miller, 1991). In this light, directors of in-service activities can accommodate the needs of individual teachers by accepting the fact that some of them may modify suggested proposals. In these instances, the strategies of the teachers should be respected and accepted if they are consistent with the goals of the in-service (Gann & Friel, 1993).

Directors of in-service activities can further accommodate the needs of teachers by simply involving them in the decisions that are made concerning the development of activities. Moreover, teachers should be made aware of how

proposed new directions relate to current practices in terms of similarities and differences. Such strategies enhance teacher involvement during the implementation stages (Gann & Friel, 1993).

Teachers need opportunities to reflect on their beliefs and practices during in-service activities. Reflection, when acted upon, generates transformation (Etchberger & Shaw, 1992), which is the ultimate goal of in-service. Reflection can be enhanced through discussions among teachers. These discussions should occur among teachers within a school as well as among teachers from different schools. Such discussions promote opportunities for teachers to share ideas and to reflect together about their practices. Additionally, inter- and intraclass visitations will enhance the sharing process further. Melissa stated, "Being able to share with other math teachers was one of the many features that I liked about the LaSIP in-service. Because teachers, like children, learn from their peers."

As teachers are "learners," opportunities should be available for them to "learn" within the context of the classroom while they are actively engaged with their students. Accordingly, in-services should contain a collaborative dimension that provides frequent teacher/staff member interaction within the classroom setting. Processes that occur in a collaborative effort such as explaining,

clarifying, elaborating, and evaluating provide support for continued reflection.

Lastly, this study indicates that a teacher's school life is affected by events in his/her personal life. Consequently, researchers must expand investigations that relate to teacher change in order to get a holistic perspective of the change process. "Expanded investigation" denotes an examination of both aspects of the personal life/school life relationship. By so doing, insights gained will more accurately describe teacher change.

Suggestions for Future Research

1. As outsiders and researchers, we need to know the way teachers' thoughts and actions evolve and change in the way that they perceive their experiences of it. Thus, additional research needs to be conducted that includes the "voices" of teachers.
2. Studies should be conducted to determine the long-term process and effect of teacher change.
3. Longitudinal studies are recommended in order to gain additional insight on the impact that teachers' personal lives have on their professional lives.

4. More studies need to be conducted that investigate teachers' reflections and the change process.
5. It is recommended that more studies investigate the relationship between teachers' "suppressed" beliefs and their classroom practices. Such studies could have a great impact on in-service programs in terms of the strategies they employ to revive these beliefs.

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APPENDIX A

CHECKLIST FOR RATING DEVELOPMENTALLY APPROPRIATE PRACTICE IN EARLY CHILDHOOD CLASSROOMS

REVISED FOR OBSERVATION OF MATHEMATICS SPECIALISTS 8/92

Based on S. Bredekamp (Ed.) (1987) Developmentally appropriate practice in early childhood programs serving children from birth through age eight (exp. ed.). Washington, D.C.: National Association for the Education of Young Children. Sections on Preschool and Primary Grades, ages 3-8.

School _____ Principal _____

Teacher _____ Ages of children _____

Number of children in room _____ Number of adults _____

Observed/rated by _____

Date(s)	Time(s)	Activity/Activities

Five points are listed for rating each item. Under 5 the most appropriate practice indicators are listed, under point 1 the most inappropriate practice indicators are listed. Point 5 indicates close to 100% appropriate, point 4 indicates more appropriate than inappropriate. Point 3 indicates a fairly even split between appropriate and inappropriate. Point 2 indicates more inappropriate than appropriate. Point 1 indicates close to 100% inappropriate. Below each item there is a space for a brief description of what you observed or found out by questioning the teacher that underlies your rating.

Developed by Rosalind Charlesworth, Jean Mosley, Diane Burts, Craig Hart, Lisa Kirk, and Sue Hernandez, Louisiana State University, Baton Rouge.

CURRICULUM GOALS

1. Range of Curriculum Areas for Which Program is Designed

5.....4.....3.....2.....1

.physical
.social
.emotional
.intellectual
.learning how to learn

.narrow focus
.intellectual emphasis
.discrete academic skills emphasis

Description:

2. The Place of Children's Self-esteem, Sense of Competence, and Positive Feelings Toward Learning In the Curriculum and Instruction.

5.....4.....3.....2.....1

.Each child is given an equal amount of positive attention

.Children who conform receive more attention
.Children are given attention according to their level of academic performance

Description:

3. View of Growth and Development.

5.....4.....3.....2.....1

.Work is individualized
.Children move at their own pace

.Evaluated against a group norm
.Everyone is expected to achieve the same narrowly defined skills
.Everyone does the same thing at the same time

Description:

TEACHING STRATEGIES

4. The Emphases in the Curriculum.

5.....4.....3.....2.....1

.Learning occurs through projects and learning centers
.Children's ideas are extended, questions are encouraged, and interests are developed
.Although math is the focus other subjects are integrated.

.Curriculum is divided into discrete subject and time units
.Emphasis on reading first and math second
.Social studies, science, health are included only if time permits
.Art, music, and physical education are taught once per week by specialists.
•Focus is on math only.

Description:

5. Organization of the Curriculum.

5.....4.....3.....2.....1

.Activities center on topics such as in science or social studies
.Topic activities include story writing and story telling, drawing, discussion, hearing stories and informational books, and cooperative activities
.Skills are taught as they are needed to complete a task

.Teacher directed reading groups
.Lecturing to the whole group
.Paper and pencil exercises, workbooks, worksheets
.Projects, learning centers, and play are offered if time permits or as a reward for completing work

Description:

6. Teacher Preparation and Organization for Instruction.

5.....4.....3.....2.....1

.Learning centers are set up which provide opportunities for writing, reading, math and language games, dramatic play
.Children are encouraged to critique their own work
.Errors are viewed as normal and something from which children can learn

.Little time for enrichment activities
.May be interest centers available for children who finish their seatwork early
.May be centers where children complete a prescribed sequence of teacher-directed activities within a controlled time period.

Description:

7. Instructional Activities.

5.....4.....3.....2.....1

.Children work and play cooperatively in groups
.Projects are self selected with teacher guidance
.Activity centers are changed frequently
.One or more field trips
.Resource people visit
.Peer tutoring
.Peer conversation

.Children work alone, silently on their worksheets or workbooks
.Little, if any, peer help is permitted
.Penalties for talking

Description:

8. Learning Materials and Activities.

5.....4.....3.....2.....1

.Concrete, real, and relevant to children's lives
.Blocks, cards, games, arts and crafts materials, woodworking tools, science equipment, etc.
.Flexible work spaces (tables, carpet, etc.)

.Limited primarily to books, workbooks, and pencils
.Permanent desks that are rarely moved
.Mostly large group instruction
.Playful activity only when work is done

Description:

INTEGRATED CURRICULUM

Note: If you reach the end of your observations and any areas cannot be rated due to lack of information, arrange to meet with the teacher and ask the open-ended clarification questions. Use the descriptors as probes if necessary.

9. Language and Literacy. Assigned to teacher: yes____ no____

5.....4.....3.....2.....1

.Technical skills are taught as needed
.Generous amounts of time are provided to learn through: literature and nonfiction reading; drawing, dictating, and writing stories; bookmaking; and library visits
.Daily reading aloud by teacher
.Subskills such as letters and phonics are taught individually and in small groups using games
.Literacy is taught through
.content areas such as science and social studies
.Children's invented spellings are accepted

.Teaching is geared to passing standardized tests and/or skill checklists
.Reading taught through skills and subskills
.Reading taught as a discrete subject
.Silence is required
.Language, writing, and spelling instruction focus on workbooks
.Teaching focuses on reading groups with other children having an adequate amount of seatwork to keep busy
.Phonics instruction stresses learning rules rather than relationships
.Everyone must complete the same basals no matter what their abilities
.Everyone knows who is in the slowest reading group.
.Acceptable writing has correct spelling and is standard English

Description:
(Clarification: Describe your language and literacy program.)

10. Math

5.....4.....3.....2.....1

.Children encouraged to use math through exploration, discovery, and solving meaningful problems
.Integrated with other areas
.Skills acquired through play, projects, and daily
.Math manipulatives are used
.Math games are used daily

.Taught as separate subject
.Taught at a scheduled time each day
.Focus on textbook, workbook, practice sheets, board work, and drill
.Lessons follow text sequence Seldom any "hands on" activity
.Must finish work in order to use games and manipulatives

Description:
(Clarification: Describe your math program.)

11. Social studies. Assigned to teacher: yes____ no____

5.....4.....3.....2.....1

.Themes may extend over a period of time
.Learned through playful activities, discussion, trips, visitors, writing, reading, social skills development, (planning, sharing, taking turns)
.Art, music, dance, drama, woodworking, and games are incorporated

.Included occasionally if reading and math are completed
.Mostly related to holidays
.Brief activities from the social studies textbook or commercially developed newspaper (i.e. Weekly Reader) and doing dittoed seatwork

Description:
(Clarification: Describe your social studies program.)

12. Science. Assigned to teacher: yes____ no____

5.....4.....3.....2.....1

.Discovery, built on the children's natural interest in the world
.Projects are experimental and exploratory, encourage active involvement of every child
.Plants and pets in the classroom
.Through projects and field trips children learn to plan, apply thinking skills, hypothesize, observe, experiment, verify
.Learn science facts related to their own experience

.Taught from a single textbook or not at all
.Complete worksheets
.Watch teacher demonstrations
.No field trips
.Materials in the science center are rarely changed

Description:
(Clarification: Describe your science program.)

13. Health and Safety. Assigned to teacher: yes____ no____

5.....4.....3.....2.....1

.Projects designed to help children use personalized facts
.They learn to integrate facts into their daily habits
.Dictate or write their own plans
.Draw and write about these activities
.Read about these activities
.Enjoy learning because it is related to their lives

.Posters and textbooks are used
.Once a week lesson or once a year unit on health

Description:
(Clarficiation: Describe your health and safety curriculum.)

14. Art, Music, Movement, Woodworking, Drama, and Dance.

5.....4.....3.....2.....1

.Integrated throughout the day
.Specialists work with teachers and children
.Children explore a variety of art media and music
.Children design and direct their own products and productions

.Taught as separate subjects once a week
.Specialists do not coordinate closely with classroom teachers
.Representational art is emphasized
.Crafts substitute for artistic expression
.Coloring book type activities
.Use patterns and cut-outs

Description:
(Clarification: Tell me about your program in the arts; such as art, music, movement, woodworking, drama, and dance.)

15. *Multicultural Education*

5.....4.....3.....2.....1

.Materials and activities are multicultural and nonsexist

.Materials and activities lack evidence of attention to cultural diversity and a nonsexist point of view

Description:
(Clarification: Tell me how you provide for multicultural education in your classroom.)

16. Outdoor Activity.

5.....4.....3.....2.....1

.Planned daily so children can develop large muscle skills, learn about outdoor environments, and express themselves freely on a well designed playground

.Limited because it interferes with instructional time or
.Provided as a time for recess to use up excess energy

Description:
(Clarification: Describe the focus of your outdoor activity program.)

GUIDANCE OF SOCIAL-EMOTIONAL DEVELOPMENT

17. Prosocial Behavior, Perseverence, and Industry

5.....4.....3.....2.....1

.Stimulating, motivating activities are provided that promote student involvement
.Individual choices are encouraged
.Enough time is allowed to complete work
.Private time with friend or teacher is provided

.Lectures about the importance of appropriate social behavior
.Punishes children who become bored and restless with seatwork and whisper, talk, or wander around
.Punishes children who dawdle and do not finish work in allotted time
.No time for private conversations
.Only the most able students finish their work in time for special interests or interaction with other students

Description:

18. Helping, Cooperating, Negotiating, and Solving Social Problems.

5.....4.....3.....2.....1

.Daily opportunities to develop social skills such as helping others, cooperating, negotiating, and talking with others to solve problems

.Little time to develop social skills--mostly independent seatwork and teacher directed activities
.Only social opportunity is on the playground but no consistent adult is available to provide guidance

Description:

19. Guidance Techniques.

5.....4.....3.....2.....1

.Positive guidance techniques are used:
-Clear limits are set in a positive manner
-Children involved in establishing rules
-Children involved in problem solving misbehavior
-Redirection is used
-Meets with child who has problems (and with parents)
.Recognize that every infraction doesn't warrant attention and identifies those that can be used as learning opportunities

.Teacher is in adversarial role
.Emphasis on power to provide rewards and punishments
.Maintaining control of the classroom is primary goal
.Teachers:
-enforce rules
-give external rewards for good behavior
-punish infractions
.When there is social conflict, participants are separated and quieted--social issue is avoided
.Teacher attitude is demeaning to child

Description:

20. Facilitation of self esteem by expressing respect, acceptance, and comfort for children regardless of their behavior.

5.....4.....3.....2.....1

.Children are trusted to make some of their own decisions
.Children are encouraged to develop their own self control
.Teacher is warm and accepting
.Teacher provides understanding and nurturance
.Teacher adapts to children's needs

.Teacher screams in anger
.Teacher neglects children's individual needs
.Physical or emotional pain is inflicted
.Criticizes, ridicules, blames, teases, insults, name-calls, threatens, frightens, and/or humiliates
.Laughs at children in derogatory manner

Description:

MOTIVATION

21. Internal vs External Sources of Motivation and Rewards for Achievement.

5.....4.....3.....2.....1

.Encourages development of internal rewards and internal critique
.Guide children to see alternatives, improvements, and solutions
.Guide children to find and correct own errors
.Teacher points out how good it feels to complete a task, to try to be successful, to live up to one's own standards for achievement
.The reward for completing a task is the opportunity to move on to a more difficult challenge

.Uses external rewards and punishments
.Corrects errors; makes sure children know right answers
.Rewards children with, stickers, praises in front of group, holds children up as examples
.Motivation is through:
-percentage or letter grades
-stickers
-stars on charts
-candy
-privileges

Description:

22. Teacher As a Model for Motivation.

5.....4.....3.....2.....1

.Through relationship with teacher, child models teacher's enthusiasm for learning, identifies with teacher's conscientious attitude toward work, and gains in self motivation

.Children identify with teacher's lack of enthusiasm and interest in his or her work and emulate it

Description:

TRANSITIONS

23. Transitions Within the School.

5.....4.....3.....2.....1

.Children are assisted in making smooth transitions between groups or programs throughout the day by teachers who:
-maintain continuity
-maintain ongoing communication
-prepare children for each transition
-involve parents
-minimize the number of transitions necessary

.Day is fragmented among many different groups and programs with little attempt by adults to communicate or coordinate successful transitions

Description:

24. Transitions Within the Classroom.

5.....4.....3.....2.....1

.transition activities (i.e. special song)
.warning signals are given
.ample time is allowed
.next activity is intrinsically enticing

.single announcement
.abrupt changes
.wait for all to arrive before begin next activity
.individuals singled out for being slow or distracted

Description:

APPENDIX B

A GUIDE FOR OBSERVING SCHOOL MATHEMATICS PROGRAMS

A GUIDE FOR OBSERVING SCHOOL MATHEMATICS PROGRAMS

Adapted by Rosalind Charlesworth, Louisiana State University, from A Guide for Reviewing School Mathematics Programs (NCTM and ASCD).

School_____Teacher_____

Grade(s)_____ Date_____Time_____ Observer_____

____Self Contained ____Departmentalized (List subjects taught): _____,

_____, _____, _____, _____

CODING: TO WHAT EXTENT IS THIS OBSERVED IN THIS CLASSROOM?

No = Not observed

Lo = Low level of implementation observed

Mod = Moderate level of implementation observed

Hi = High level of implementation observed

NA =Not applicable in this setting

FROM A MATHEMATICS INSTRUCTION REVIEW GUIDE DEVELOPED BY NCTM AND ASCD

CURRICULUM K-4

A. Problem Solving (Critical-Thinking Skills)	Descriptions/Examples
____ 1. Instructional activities regularly include problem solving with mathematical applications that are meaningful to students.	
____ 2. Instructional activities integrate other subject areas.	
____ 3. A variety of strategies (e.g., patterns, guess and check, working backwards, diagramming, simulation, deduction, logical thinking) are used to develop higher-level thinking skills.	
____ 4. Instructional activities include real problems with manipulative, laboratory, and outdoor experiences and technology (e.g.,computers and/or calculators).	
____ 5. Estimation is used to determine reasonableness of answers.	

B. Communicating Mathematical Ideas	
____ 1. Understandings and relationships between and among mathematical concept, procedures, and symbols are communicated through writing and speaking. This is done at each stage of conceptual development--concrete, pictorial, abstract--and in every area of mathematics.	
____ 2. Mathematics information is exchanged in a variety of ways such as speaking, drawing, graphing, writing, demonstrating concretely, and doing projects.	
____ 3. Mathematics information is received by listening, visualizing, and reading.	

INSTRUCTION

A. Teaching Strategies and Instructional Activities	Descriptions/Examples
____ 1. Teaching practices include large-group, small-group, and individualized instruction when appropriate.	
____ 2. Varied instructional strategies are used.	
____ 3. The classroom environment encourages students to interact with peers and the teacher, to take risks, to explore, and to seek their own solutions to problems.	
____ 4. Calculators are used by all students as an integral part of the program at all levels.	
____ 5. Computers and appropriate software are used by all students.	
____ 6. Teaching strategies that foster the development of higher-order thinking, reasoning, problem solving, and communicating math ideas are used.	
____ 7. Activities for developing mathematical concepts are appropriate to the students' levels of development and progress from the use of manipulatives to the pictorial to the abstract or symbolic.	
____ 8. Teachers use instructional strategies that are compatible with students' learning styles.	
____ 9. Problems using realistic application situations are used to introduce and develop mathematical concepts as well as to reinforce them.	
____ 10. Instructional activities are designed to build on students' previous mathematical experiences.	

B. Human and Material Resources and Facilities

____ 1. Appropriate mathematics materials in sufficient quantities are provided for all students, including those who are mathematically gifted or in need of remediation and those who are members of underrepresented groups (e.g., females, African Americans, American Indians, language-minority students) in the student population.

____ 2. Sufficient time is allotted for effective and efficient mathematics instruction whether integrated or taught as a separate subject.

____ 3. Instructional and resource areas--large-group spaces, small-group spaces, individual area, math centers, computer centers, library-media centers--support flexible grouping and student choice and responsibility.

____ 4. Teachers have ready access to equipment to support the instructional program:

____ manipulatives ____ chalkboards
____ bulletin boards ____ calculators
____ tape player ____ overhead projector
____ record player ____ computer(s)
____ projectors (movie or filmstrip)

____ 5. Audiovisual materials are readily available and integrated into the instructional program.

QUESTIONS FOR THE TEACHER: TO BE ASKED AT THE TIME OF THE OBSERVATION VISIT

1. Have you continued to add to your portfolio?

2. If you planned to use student portfolios, have you been able to implement the process?

3. Which of the following human resources are available to support the mathematics program?

____ department/grade level heads	____ teacher aides	____ technology specialists
____ parent volunteers	____ other volunteers	____ librarian
____ auxiliary staff	____ referral services	____ resource teachers
____ consultants	____ workshops	

4. How do you feel you are progressing in the implementation of developmentally appropriate mathematics instruction? Which aspects do you find easiest to implement? Which, if any aspect, do you find most difficult?

APPENDIX C

THE TEACHER QUESTIONNAIRE

TEACHER QUESTIONNAIRE
(Pre-K and Kindergarten Version)

Indicate the amount of influence you believe each has on the way you plan and implement instruction.

	A Very Little Influence	B	C Moderate Influence	D	E Much Influence
1. Parents	A	B	C	D	E
2. School system policy	A	B	C	D	E
3. Principal	A	B	C	D	E
4. Teacher (yourself)	A	B	C	D	E
5. State regulations	A	B	C	D	E
6. Other teachers	A	B	C	D	E
7. School advisory council	A	B	C	D	E

Please respond to the following items by darkening in the letter that most nearly represents YOUR PERSONAL BELIEFS about the importance of that item for the grade that you teach (pre-k or kindergarten).

A Not important at all	B Not very important	C Fairly important	D Very important	E Extremely important

8.	As an evaluation technique in pre-k or kindergarten, standardized group tests are _____.	A B C D E
9.	As an evaluation technique in pre-k or kindergarten, teacher observation is _____.	A B C D E
10.	As an evaluation technique in pre-k or kindergarten, performance on worksheets and workbooks is _____.	A B C D E
11.	It is _____ for pre-k or kindergarten activities to be responsive to individual differences in interest.	A B C D E
12.	It is _____ for pre-k or kindergarten activities to be responsive to individual differences in development.	A B C D E
13.	It is _____ that each curriculum area be taught as separate subjects at separate times.	A B C D E
14.	It is _____ for teacher-pupil interactions in pre-k or kindergarten to help develop children's self-esteem and positive feelings toward learning.	A B C D E

A	B	C	D	E
Not important at all	Not very important	Fairly important	Very important	Extremely important

15. It is _____ for children to be allowed to select many of their own activities from a variety of learning areas that the teacher has prepared (blocks, science center, etc.). A B C D E

16. It is _____ for children to be allowed to cut their own shapes, perform their own steps in an experiment, and plan their own creative drama, art, and writing activities. A B C D E

17. It is _____ for students to work silently and alone on seatwork. A B C D E

18. It is _____ for pre-k or kindergartners to learn through active exploration. A B C D E

19. It is _____ for pre-k or kindergartners to learn through interaction with other children. A B C D E

20. Workbooks and/or ditto sheets are _____ to the pre-k or kindergarten program. A B C D E

21. Flashcards (numbers, letters, and/or words) are _____ to the pre-k or kindergarten program for instructional purposes. A B C D E

22. The basal reader is _____ to the pre-k or kindergarten reading program. A B C D E

23. In terms of effectiveness, it is _____ for the teacher to talk to the whole group and make sure everyone participates in the same activity. A B C D E

24. In terms of effectiveness, it is _____ for the teacher to move among groups and individuals, offering suggestions, asking questions, and facilitating children's involvement with materials and activities. A B C D E

25. It is _____ for teachers to use their authority through treats, stickers, and/or stars to encourage appropriate behavior. A B C D E

26. It is _____ for teachers to use their authority through punishments and/or reprimands to encourage appropriate behavior. A B C D E

27. It is _____ for children to be involved in establishing rules for the classroom. A B C D E

28. It is _____ for children to be instructed in recognizing the single letters of the alphabet, isolated from words. A B C D E

A	B	C	D	E
Not important at all	Not very important	Fairly important	Very important	Extremely important

29. It is _____ for children to color within predefined lines. A B C D E

30. It is _____ for children in pre-k or kindergarten to form letters correctly on a printed line. A B C D E

31. It is _____ for children to have stories read to them individually and/or on a group basis. A B C D E

32. It is _____ for children to dictate stories to the teacher. A B C D E

33. It is _____ for children to see and use functional print (telephone books, magazines, etc.) and environmental print (cereal boxes, potato chip bags, etc.) in the pre-k or kindergarten classroom. A B C D E

34. It is _____ for children to participate in dramatic play. A B C D E

35. It is _____ for children to talk informally with adults. A B C D E

36. It is _____ for children to experiment with writing by inventing their own spelling. A B C D E

37. It is _____ to provide many opportunities to develop social skills with peers in the classroom. A B C D E

38. It is _____ for pre-k or kindergartners to learn to read. A B C D E

39. In the pre-k or kindergarten program, it is _____ that math be integrated with all other curricula areas. A B C D E

40. In teaching health and safety, it is _____ to include a variety of activities throughout the school year. A B C D E

41. In the classroom setting, it is _____ for the child to be exposed to multicultural and nonsexist activities. A B C D E

42. It is _____ that outdoor time has planned activities. A B C D E

43. Input from parents is _____. A B C D E

Please respond to the following items by darkening in the letter that most nearly represents HOW OFTEN your children participate in the following activities, on the average.

	A	B	C	D	E
	Almost Never (less than monthly)	Rarely (monthly)	Sometimes (weekly)	Regularly (2-4/week)	Very Often (daily)
44.	building with blocks.	A	B	C	D	E
45.	children selecting centers (home, book, math, science, writing, etc.)	A	B	C	D	E
46.	participating in dramatic play	A	B	C	D	E
47.	listening to records and/or tapes	A	B	C	D	E
48.	doing creative writing (combining symbols/invented spelling and drawing)	A	B	C	D	E
49.	playing with games and puzzles	A	B	C	D	E
50.	exploring animals, plants, and/or wheels and gears	A	B	C	D	E
51.	singing and/or listening to music	A	B	C	D	E
52.	creative movement	A	B	C	D	E
53.	cutting their own shapes from paper	A	B	C	D	E
54.	playing with manipulatives such as pegboards, puzzles, and/or LEGO type blocks	A	B	C	D	E
55.	coloring and/or cutting predrawn forms	A	B	C	D	E
56.	children reading in ability level groups	A	B	C	D	E
57.	circling, underlining, and/or marking on items on worksheets	A	B	C	D	E
58.	using flashcards with sight words and/or math facts	A	B	C	D	E
59.	rote counting	A	B	C	D	E

	A Almost Never (less than monthly)	B Rarely (monthly)	C Sometimes (weekly)	D Regularly (2-4/week)		E Very Often (daily)
60.	practicing handwriting on lines		A	B	C	D	E
61.	reciting the alphabet		A	B	C	D	E
62.	copying from the chalkboard		A	B	C	D	E
63.	sitting for longer than 15 minutes		A	B	C	D	E
64.	waiting for longer than 5 minutes between activities		A	B	C	D	E
65.	large group teacher directed instruction		A	B	C	D	E
66.	children coordinating their own activities in centers		A	B	C	D	E
67.	tangible rewards for appropriate behavior and/or performance		A	B	C	D	E
68.	losing special privileges (trips, recess, free time, parties, etc.) for misbehavior		A	B	C	D	E
69.	social reinforcement (verbal praise, approval, attention, etc.) for appropriate behavior and/or performance		A	B	C	D	E
70.	using isolation (time out, standing in the corner or outside of the room) to obtain child compliance		A	B	C	D	E
71.	games/activities directed by or made by parents		A	B	C	D	E
72.	specifically planned outdoor activities		A	B	C	D	E
73.	multicultural and nonsexist activities		A	B	C	D	E
74.	competitive math activities to learn math facts		A	B	C	D	E
75.	health and safety activities		A	B	C	D	E

A	B	C	D	E
Almost Never (less than monthly)	Rarely (monthly)	Sometimes (weekly)	Regularly (2-4/week)	Very Often (daily)

76. drawing, painting, working with playdough, and other art media — A B C D E

77. math incorporated with other subject areas — A B C D E

Answer the following:

A	B	C	D	E
1 or less years	2-5 years	6-10 years	11-15 years	16 or more years

78. How many total years have you taught? A B C D E

79. How many years have you taught the current grade? A B C D E

A	B	C	D	E
10 & below	11-15	16-20	21-25	26 & over

80. How many children are in your classroom? A B C D E

Answer the following questions by darkening in A=Yes, B=No:

81. A screening/readiness score was used as the criterion to enroll children in this class.

82. I team-teach with another teacher in this classroom.

83. This classroom is a pre-k classroom.

84. This classroom is a kindergarten classroom.

85. If this is a pre-k classroom, indicate through which pre-k program you are funded.

A	B	C	D	E
High-Risk 8-G	Redesign	Chapt. I	Noncat.	Integrated (Handicapped/ Nonhandicapped)

Darken in "A" for each organization you belong to:

86. LACUS
87. SACUS
88. QEEC
89. NAEYC
90. ACEI
91. LRA
92. IRA
93. NCTM
94. NSTA
95. NCTE
96. NCSS

Darken in "A": for each of the following that you have done <u>within the last year</u>:

97. Read early childhood articles in professional journals
98. Attended in-service workshops in early childhood education
99. Attended professional early childhood education conferences
100. Took college course/s in early childhood education and/or child development

Field A

Highest Degree Earned
1 = BS/BA
2 = MS/MA/MED
3 = masters + 30/Specialist
4 = Ph.D/Ed.D

Field B

College/University received highest degree from:
0 = LSU
1 = Southern
2 = Southeastern
3 = Nicholls
4 = Northeast
5 = Other Louisiana Public University
6 = Louisiana Private University
7 = Out of State Public University
8 = Out of State Private University
9 = Other

APPENDIX D

INTERVIEW QUESTIONS: TEACHER

INTERVIEW QUESTIONS: TEACHER

Biographical Data

1. Tell me about yourself. Please include your educational background.
   Prompt: Highest degree?
   Prompt: What other workshops have you attended? Why did you decide to attend them?
2. How many years have you taught at Clinton Elementary?
3. What else have you taught and where?
4. What grade/subject do you prefer teaching? Why?
   Prompt: (If math is not mentioned) How do you feel about math?
5. Please tell me about your students.
6. I would like for you to reminisce on your days as a student. How did you feel about math? Why?
   Prompt: Is there one particular math teacher that you remember well? Why?
7. Have any of the experiences that you had as a student had an impact on your teaching?
   Prompt: (If college is not mentioned) What about the experiences you had as a college student?
8. How did you become the teacher you are today?
9. Please tell me about some of the classroom experiences you had as a teacher over the years.

10. Has your method of teaching remained the same over the years? Why or why not?
11. Both you and Mrs. Brown attended the LaSIP workshop. Why did you decide to teach math?

Beliefs

12. How do you view your role as teacher?
13. How do you view the role of students during a math lesson?
14. How do you think kindergartners learn math best?
15. How do you feel about the use of learning centers?
16. Do you believe children are learning when they use hands-on materials? Why?
17. Do you believe children learn as much while moving around as ones that don't have freedom of movement? Why?
18. How do you feel about children working together?
19. Do you think you are meeting the needs of the class when you are teaching concepts one-on-one? Why?
20. Do you feel more comfortable teaching math now than in previous years? Why?

Practices

21. Has your approach to teaching changed over the years? Why? Please give me a few examples.

22. What kind of resources/instructional materials did you use in the past? Why?
23. Name one concept that kindergartners have a hard time grasping. How did you teach that concept in the past? How did you teach it this year?
24. During one of my observations, you presented a lesson on the concepts time and patterning. You used your students' clothing as your focus for this lesson. Can you describe for me how you would have taught that lesson in the past?
25. Describe the type of activities you usually plan for the beginning of the school year.
26. How was your classroom organized in the past?
27. What kind of materials did you order in the past?
28. Did you have a designated time to teach math to your kindergartners in the past?

APPENDIX E

INTERVIEW QUESTIONS: PRINCIPAL

INTERVIEW QUESTIONS: PRINCIPAL

1. You have known Mrs. Jones for three years. Can you tell me about her teaching practices prior to the LaSIP workshop?
2. Do you think she enjoyed teaching math before? Why?
3. Do you think she enjoys teaching math now?
4. As principal, I am sure that you observed not only Mrs. Jones teaching practices but also how the children responded to her. Can you tell me what you observed?
5. What kind of materials did she use?

APPENDIX F

INTERVIEW QUESTIONS: LaSIP RESEARCHERS

INTERVIEW QUESTIONS: LaSIP RESEARCHERS

1. You had an opportunity to observe Mrs. Jones earlier this year. Please tell me about your observations.
2. What kind of materials did she use?
3. Did she use a variety of teaching strategies?
4. Did she use manipulatives in her presentations? What type?
5. Were all of her lessons of a whole-group type?
6. How did the children respond to her?
7. Did she integrate mathematics with other subject areas?
8. Were the children allowed to interact with Mrs. Jones and their classmates?

APPENDIX G

INTERVIEW QUESTIONS: LaSIP FACULTY MEMBERS

INTERVIEW QUESTIONS: LaSIP FACULTY MEMBERS

1. What were your objectives for the LaSIP workshop?
2. If you had an opportunity to observe the LaSIP participants in their classrooms, what would you look for?

APPENDIX H

CONSENT FORMS (TEACHER AND PRINCIPAL)

AND COPYRIGHT LETTERS

LOUISIANA STATE UNIVERSITY
AND AGRICULTURAL AND MECHANICAL COLLEGE
Department of Curriculum and Instruction

February 26, 1993

Consent Form
(Teacher)

I, _____, volunteer to participate in the study on a kindergarten teacher's beliefs and practices conducted by Bessie L. Davis of Louisiana State University. I understand that my identity will not be revealed, that I can withdraw from the study at any time, and that my performance in this study may be used for additional projects. I also understand that I will be able to ask questions prior to the beginning and completion of this study.

_____ _____
Signature Date

223 Peabody Hall • Baton Rouge • Louisiana • 70803-4728 • 504/388-6867 • FAX 504/334-1045

LOUISIANA STATE UNIVERSITY
AND AGRICULTURAL AND MECHANICAL COLLEGE
Department of Curriculum and Instruction

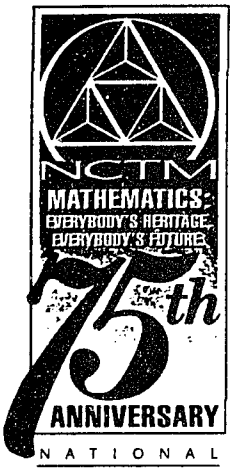
February 26, 1993

Consent Form
(Principal)

I, _____, volunteer to participate in the study on a kindergarten teacher's beliefs and practices conducted by Bessie L. Davis of Louisiana State University. I understand that my identity will not be revealed and that any information that I provide during interviews with this researcher regarding the teaching practices of this particular kindergarten teacher will be confidential. I also understand that I can withdraw from the study at any time.

_____ _____
Signature Date

223 Peabody Hall • Baton Rouge • Louisiana • 70803-4728 • 504/388-6867 • FAX 504/334-1045



NATIONAL
COUNCIL OF
TEACHERS OF
MATHEMATICS

25 August 1994

Bessie Davis
3450 Nicholson Drive
Apartment 1036
Baton Rouge, LA 70802

Dear Ms. Davis:

This letter constitutes our permission for you to use the "Guide for Observing School Mathematics Programs" in the appendix of your doctoral dissertation, as requested in your letter of 25 July 1994.

Sincerely yours,

Jean Carpenter

Jean T. Carpenter
Permissions Editor

1906 Association Drive ▲ Reston, VA 22091-1593 ▼ (703) 620-9840 ▲ Fax (703) 476-2970 ▼ Internet nctmath@tmn.com

WEBER STATE UNIVERSITY
College of Education

Department of Child and Family Studies
Ogden, UT 84408-1301
(801) 626-7386

July 19, 1994

Bessie Davis
LSU College of Education
Baton Rouge, LA 70803

Dear Ms. Davis:

You are hereby granted permission to include copies of the following items in your dissertation:

1. The Teacher Questionnaire (Teacher Beliefs Scale and Instructional Activities Scale)
2. Checklist for Rating Developmentally Appropriate Practice in Kindergarten Classrooms (Revised for observation of mathematic's specialists, 8/92)
3. A Guide for Observing School Mathematics Programs (10/92)

Sincerely yours,

Rosalind Charlesworth

Rosalind Charlesworth, Ph.D.
Professor

VITA

Bessie L. Davis was born in Vance, South Carolina. She graduated from Roberts High School in Holly Hill, South Carolina in 1967. After high school, Bessie embarked on a new phase of her educational experience. She enrolled at Claflin College and was awarded a Bachelor of Arts degree in Education in 1971. After teaching for three years at Holly Hill Middle School, she enrolled in graduate school at Howard University. She received her Masters degree in Elementary Curriculum and Instruction in August of 1975.

In 1975, Bessie returned to Holly Hill Middle School where she continued to teach fifth grade mathematics. She served as chairperson of the mathematics department for eight years. As chairperson, Bessie developed a handbook of enrichment activities for grades four through seven. She also initiated the use of a computerized system for testing purposes.

While completing practicum experiences in educational administration in 1984, she developed a management system for attendance for Holly Hill Middle School. That management system is still being used at the school.

Bessie was selected Teacher of the Year by her colleagues in 1985. She then competed at the district-level and was chosen the Teacher of the Year for Orangeburg School District #3.

She has served on numerous district-level committees. She has also served on Visiting Committees throughout the state of South Carolina for the Southern Association of Colleges and Schools.

Bessie's area of concentration for her Ph.D. was Curriculum and Instruction with a focus in Early Childhood Education.

DOCTORAL EXAMINATION AND DISSERTATION REPORT

Candidate: Bessie L. Davis

Major Field: Curriculum and Instruction

Title of Dissertation: An Ethnographic Study of a Kindergarten Teacher's Beliefs and Practices Before and After Mathematics In-service

Approved:

Barbara Claxton Co-Chair
Elizabeth Jensen Co-Chair
Major Professor and Chairman

Dean of the Graduate School

EXAMINING COMMITTEE:

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Date of Examination:

September 7, 1994